EVIDENCE REPORT AND EVIDENCE-BASED RECOMMENDATIONS:

Interventions to Promote Smoking Cessation in the Medicare Population

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CONTRACT NUMBER: 500-98-0281

CONTRACT PERIOD: October 30, 1998 TO September 29, 2003

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Preface

The Health Care Financing Administration (HCFA), in consultation with other Agencies in the Department of Health and Human Services, initiated the Healthy Aging Project to enhance and promote the health of older people. A major objective of the Healthy Aging Project is to identify, synthesize and disseminate evidence and expert opinion on health promotion and disease prevention interventions that are evidence-based. HCFA is sponsoring reports that present evidence and expert opinion to assist public and private sector organizations in their efforts to improve the delivery of Medicare-covered preventive benefits and promote behavioral risk factor reduction. These reports provide comprehensive, science-based information on effective and cost-effective interventions targeting the senior population. RAND is producing these reports under a HCFA contract.

HCFA expects that these evidence reports will inform peer review organizations, individual health plans, providers and purchasers, including Medicare and Medicaid, as well as the health care system as a whole by providing important information to help improve the delivery and quality of preventive health care for older people.

We welcome written comments on this evidence report. They may be sent to:

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The Southern California Evidence-Based Practice Center

The Southern California Evidence-Based Practice Center is part of the Evidence-Based Practice Program sponsored by the Agency for Health Care Policy and Research. One of 12 such Centers nationwide, the Center conducts systematic reviews and technology assessments of all aspects of health care; performs research on improving the methods of synthesizing the scientific evidence and developing evidence reports and technology assessments; and provides technical assistance to other organizations in their efforts to translate evidence reports and technology assessments into guidelines, performance measures, and other quality-improvement tools.

The Center combines the talents of RAND and its five affiliated regional health care institutions: the University of California, Los Angeles; the University of California, San Diego; Cedars-Sinai Medical Center; the University of Southern California; and Value Health Sciences. In addition, through the VA/RAND/ University of California Field Program "Center for the Study of Health Care Provider Behavior," four Department of Veterans Affairs facilities collaborate with the Center. The Center is also affiliated with five health services research training programs.

The Southern California Center is the natural outcome of more than 20 years of work by RAND and its affiliated institutions in reviewing the biomedical literature for evidence of benefits, harms, and costs; using meta-analysis, decision analysis, and cost-effectiveness analysis to synthesize the literature; developing measures of clinical appropriateness and practice guidelines; developing and assessing medical review criteria; and developing and assessing performance measures and other tools for translating evidence-based knowledge into clinical practice. The hallmark of this work has been (a) its multi-disciplinary nature: RAND and its affiliated institutions combine the talents of clinicians, health services researchers, epidemiologists, statisticians, economists, and advanced methods experts in meta-analysis and decision analysis; (b) the advancement of knowledge about the methods for performing literature reviews, synthesizing evidence, and developing practice guidelines or review criteria; and (c) the emphasis on developing and evaluating products for use in the real world of health care delivery.

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INTRODUCTION

Smoking is the single most preventable cause of morbidity and mortality in the United States. Smoking is a major risk factor for cardiovascular disease, chronic obstructive pulmonary disease, cancer, hypertension, diabetic complications and osteoporosis.[1, 2] Tobacco use causes more than 430,000 deaths, and costs the United States between $50 and $73 billion in medical expenses each year.[3, 4]

In 1995, 47 million U.S. adults 18 years of age and older reported that they were current smokers. Approximately 70% of current smokers expressed their desire to quit smoking completely, while almost 46% reported they had stopped smoking for at least one day in the preceding 12 months.[5]

Approximately 13% of people 65 and older reported that they were smokers in 1995.[5] Today's older smokers grew up in an era in which advertisers, even physicians, promoted smoking; the adverse effects of smoking had not yet been established. The consequences of smoking among this cohort are now evident. In 1990, smoking caused over 287,000 deaths in the U.S. among persons age 65 and older--about 70% of the U.S. smoking-related deaths that year.[6]

Zhang and colleagues estimated that smoking-related illnesses accounted for about $14.2 billion in Medicare expenditures in 1993, about 9.4% of Medicare's total budget. More specifically, smoking accounted for 11.4% of hospital care, 11.3% of nursing home care, 5.9% of home health care, and 5.6% of ambulatory care.[7] It is estimated that between 1995 and 2015, tobacco-related diseases will cost Medicare about $800 billion.[8]

There are significant benefits to smoking cessation, even after 30 or more years of regular smoking.[9] Data from the Established Population for the Epidemiological Study of Elderly (EPESE) indicate that smokers who quit have cardiovascular mortality rates similar to those of nonsmokers, and that this benefit is unrelated to age or the time elapsed since cessation.[10] In one study, older smokers who already had coronary artery disease improved their survival and risk of heart attack by quitting.[11] In addition, lung function and circulation begin to improve immediately after cessation.[12] A person who smokes more than 20 cigarettes per day and who quits at age 65 can expect to increase his or her life expectancy by 2 to 3 years.[13] Quitting smoking also greatly increases the quality of life for older adults.

Unfortunately, older smokers may be less likely to perceive the health consequences of smoking. For example, according to a recent survey of members of the American Association of Retired Persons (AARP), 47% of smokers age 50 and over did not believe that quitting could improve their health. In addition, 45% did not believe that continuing to smoke could further damage their health.[14] Still, older smokers are more likely to achieve success in their cessation attempts than younger smokers are.[15, 16] Thus, although special emphasis needs to be applied in addressing the barriers to quitting among the elderly, age is not a significant obstacle to cessation interventions.

A number of interventions to improve smoking cessation have been studied, and many of these are recommended in clinical practice guidelines promulgated by various organizations.[17] To better understand such interventions in the Medicare population, the Health Care Financing Administration (HCFA), as part of its Healthy Aging project, commissioned an evidence-based systematic review of smoking cessation, the results of which are detailed in this report.

METHODS

We employed the evidence review and synthesis methods of the Southern California Evidence Based Practice Center, an Agency for Healthcare Research and Quality designated center for the systematic review of literature on the evidence on benefits and harms of health care interventions. Our literature review process consisted of the following steps:

- Develop a conceptual model.
- Identify sources of evidence (in this case, sources of scientific literature).
- Identify potential evidence.
- Evaluate potential evidence for methodological quality and relevance.
- Extract study-level variables and results from studies meeting methodological and clinical criteria.
- Synthesize the results.

The interventions used to promote smoking cessation among persons age 65 or older fell into the following broad categories: self-help, counseling, pharmacotherapy, education, financial incentives (provider and patient), regulatory and legislative interventions, and media campaigns. We used several sources to identify existing research and potentially relevant evidence, including the Cochrane Collaboration Tobacco Group database, the draft Public Health Service (PHS) clinical practice guideline,[18] ten previously completed systematic reviews, and a library search of the computerized databases Medline, PsychLit, Dissertation Abstracts, Applied Social Sciences Index, and Social Science Citations Index.

While we were primarily searching for data relevant to the Medicare population, we included studies on adult populations under age 65 to avoid loss of potentially useful data. To be accepted as evidence, a study had to measure quit rates at least five months from the start of an

intervention and use one of the following designs: randomized controlled trial, controlled clinical trial, controlled before and after study, or interrupted time series with adequate data points. From these articles we abstracted data such as the number and characteristics of patients; setting, location, and target of the intervention; intensity of the intervention; types of outcome measures; time from intervention until outcome measurement; and results. In the analysis itself, we sought to answer the following questions specified by HCFA:

1. If Medicare were to offer a smoking cessation benefit, how would providers be reimbursed? For example, by minutes of counseling?
2. How useful is provider training?
3. How should provider compliance be measured and monitored?
4. What means could be used to curb overutilization? Cost sharing by patients? Annual caps on services?
5. How effective are patient financial incentives?
6. How effective is telephone counseling?
7. How effective is other counseling?
8. How effective is pharmacotherapy?
9. How effective is self-help?
10. Which practice settings are most effective? Outpatient? Hospital? Free-standing smoking cessation clinics?
11. Who is most effective at delivering smoking cessation interventions? Physicians? Psychologists? Nurses? Dentists?
12. Do certain interventions work better for special populations?
13. What are costs of interventions?
14. Which interventions are most cost-effective?

Some of these questions were similar or even identical to questions being assessed by the team developing the Public Health Service Report Treating Tobacco Use and Dependence: A Clinical Practice Guideline.[18] However, the focus of this HCFA report was to draw inferences for

Medicare programs and policies for an insurance benefit. With the permission of the principal investigator of the Public Health Service project, we present their analyses where applicable. A panel of experts was convened on October 21, 1999; feedback from the panel was useful in fine-tuning our analysis and recommendations.

RESULTS

Our search yielded 488 articles, 248 of which met our screening criteria. The type of intervention examined in the greatest number of studies, 149, was patient education; we found 118 studies that used individual counseling, 104 studies that used self-help, and 76 studies that used patient financial incentives. (These categories are not mutually exclusive.) Of the 248 selected studies, 40 were randomized or controlled clinical trials.

There were no studies comparing smoking cessation outcomes as a function of different reimbursement schemes (Question 1) or addressing the issue of provider compliance and monitoring (Question 3).

QUESTION 2. HOW USEFUL IS PROVIDER TRAINING?

A recent meta-analysis[19] of nine studies provided data on the effect of provider education on both provider performance and patient smoking cessation rates. Eight of the studies reported the effect of training medical practitioners, while one reported the effect of training dental practitioners. The provider training in all studies was conducted on a group basis, in either a tutorial or a workshop format. The analysis showed that trained providers were significantly more likely to perform smoking-cessation tasks than untrained providers. Patient outcomes were also affected: Patients who saw trained providers were more likely to stop smoking than those who saw untrained providers (pooled odds ratio=1.48, 95% C.I.=1.20 to 1.83).

QUESTION 4 & 5. WHAT MEANS CAN BE USED TO CURB OVERUTILIZATION? HOW EFFECTIVE ARE PATIENT FINANCIAL INCENTIVES?

We found one article that reported on the effectiveness and cost-effectiveness of different levels of coverage for both a behavior modification benefit and a nicotine replacement benefit for smoking cessation. This study was performed at a health maintenance organization (HMO) in the Pacific Northwest and involved over 90,000 patients.[20] The four benefit strategies are shown in the table below.

Cost-Sharing Plans Analyzed

Plan	Behavior Benefit	Nicotine Replacement Benefit	Cost/Quitter
Full	100%	100%	$1171
Standard	50%	100%	$797
Flipped	100%	50%	$870
Reduced	50%	50%	$801

The most cost-effective benefit plans (from the health plan perspective) were those in which the patients bore some financial responsibility for the smoking cessation program. However, full coverage of both benefits resulted in more quitters (approximately two to four times as many quitters in the full benefit plan as in the reduced coverage plans).

We found no studies that specifically addressed curbing overutilization or the effect of capitation limits on services. Our expert panel emphasized that overutilization should not be a problem, and that we should concentrate on convincing smokers to engage in cessation interventions.

QUESTION 6 & 7. HOW EFFECTIVE IS COUNSELING?

A number of systematic reviews have examined the effectiveness of counseling for smoking cessation.[17, 18, 21-23] Preliminary results from the 2000 Public Health Service clinical practice guideline[18] show that all forms of counseling are statistically significantly effective at promoting smoking cessation. In the analysis, individual counseling yielded the highest adjusted odds ratio for success, followed by group counseling, phone counseling, and self help. Individual counseling was statistically significantly superior to self-help (which itself was only marginally statistically different than control). The greater effectiveness of individual counseling over telephone counseling approached statistical significance. There was no statistically significant difference in effectiveness between group counseling and telephone counseling. In another quantitative systematic review that examined only physician counseling,[24] 16 trials reported the effect of brief advice on smoking cessation. These trials had a pooled odds ratio of 1.69 (95% C.I.=1.45 to 1.98). Intensive counseling was found to be more effective than minimal advice, with a pooled odds ratio of 1.44 (95% C.I.=1.23 to 1.68).

A recent meta-analysis of five studies[23] found group counseling more effective than no intervention or minimal contact, with a pooled odds ratio of 1.91 (95% C.I.=1.20 to 3.04). In two trials that compared group counseling directly with individual counseling, there were no statistically significant differences between the two interventions.

The 1996 smoking cessation guidelines revealed an apparent dose-response curve between the *amount* of counseling and the smoking cessation rate. For contact less than or equal to three minutes, the adjusted odds ratio was 1.2 (95% C.I.=1.0 to 1.5), and for contact longer than 10 minutes, the adjusted odds ratio increased to 2.4 (95% C.I.=2.1 to 2.7). Counseling lasting

between three and 10 minutes had an intermediate adjusted odds ratio of 1.4 (95% C.I.=1.2 to 1.7). Results from the new PHS clinical practice guideline shows a similar trend.[18]

According to the 1996 guidelines, there is a similar relationship for the *duration* of individual counseling. Counseling with a duration of less than two weeks was found to be less effective than counseling that lasted more than eight weeks (adjusted odds ratio of 1.1 versus 2.7). Counseling lasting between two and eight weeks showed intermediate effectiveness (adjusted odds ratio of 1.6). The *number* of counseling sessions also showed a similar dose-response relationship, with a trend toward increasing smoking cessation rates with increasing number of individual treatment sessions up to seven sessions. Preliminary results from the 2000 PHS clinical practice guideline shows an odds ratio of 1.4 (95% C.I.=1.1 to 1.7) for two to three sessions, an odds ratio of 1.9 (95% C.I.=1.6 to 2.2) for four to eight sessions, and an odds ratio of 2.3 (95% C.I.=2.1 to 3.0) for more than eight sessions.

In conclusion, all forms of counseling have statistically significant effects on smoking cessation, with individual counseling appearing to be the most effective method. Dose-response curves are available for length of time spent on each counseling session, number of sessions, and total duration of counseling intervention.

QUESTION 8. HOW EFFECTIVE IS PHARMACOTHERAPY?

In a recent meta-analysis of 91 trials,[24] nicotine replacement therapy (NRT) was more effective than the control in smoking cessation, with a pooled odds ratio of 1.72 (95% C.I.=1.60 to 1.84). Different forms of NRT produced moderately different results, shown in the table below. Since the confidence intervals around these estimates of effect overlapped, there was no evidence of a

significant difference in the effectiveness of the five types of NRT. The PHS clinical practice guideline shows a very similar trend in odds ratios.[18]

Effectiveness of Nicotine Replacement Therapy versus Control

Delivery Mechanism	Pooled Odds ratio
Gum (49 studies)	1.63
Sublingual tablet (2 studies)	1.73
Patch (32 studies)	1.77
Inhaled nicotine (4 studies)	2.08
Nasal spray (4 studies)	2.27

A quantitative systematic review of four studies that compared buproprion-SR users with a control group[25] reported a pooled odds ratio of 2.73 (95% C.I.=1.90 to 3.94). Buproprion-SR is an antidepressant sold as Wellbutrin. Currently marketed toward smokers under the name Zyban, it is the only FDA-approved drug for smoking cessation other than NRT. The same review also reported that two studies of nortriptyline (a tricyclic antidepressant) had a pooled odds ratio of 2.83 (95% C.I.=1.59 to 1.03).

Three quantitative systematic reviews on clonidine[17, 27] (which included six studies, seven studies, and 10 studies, respectively) reported pooled odds ratios of 1.89 (95% C.I.=1.30 to 2.74) and 3.0 (95% C.I.=1.5 to 5.9), respectively, for the first two studies, and a quit rate of 5.7% (95% C.I. = –1.3% to 12.7%) in the third study for clonidine, compared with control. There was, however, a high incidence of dose-dependent side effects, particularly sedation and dry mouth. Clonidine is used to treat hypertension; it has not been approved by the FDA for smoking cessation.

Two quantitative systematic reviews[17, 25] found no effectiveness for anxiolytics such as buspirone, diazepam, or meprobamate.

QUESTION 9. HOW EFFECTIVE IS SELF-HELP?

Two systematic reviews have reported results on self-help interventions.[17, 22] In the first, a meta-analysis of 25 studies[22] reported a pooled odds ratio of 1.23 (95% C.I.=1.01 to 1.51) compared with control. In the second, a meta-analysis of twelve studies[17] reported a pooled odds ratio of 1.2 (95% C.I.=0.97 to 1.6) compared with control. (Similar results were reported in the 2000 Public Health Service clinical practice guideline.[18] These data indicate that self-help materials have a small practical effect on smoking cessation. Studies of helpline/hotline forms of self-help, used alone, had an odds ratio of 1.4 (95% C.I. = 1.1 to 1.8). There is no evidence that adding self-help materials to individual counseling or NRT improved smoking cessation rates.[22]

QUESTION 10. WHAT PRACTICE SETTINGS ARE EFFECTIVE?

Interventions for patients hospitalized with smoking-related illness

Hospitalization gives patients a unique opportunity to quit smoking, as all U.S. hospitals are smoke-free. We found nine studies of interventions with hospitalized patients. We considered conducting a meta-regression on hospital interventions versus usual care in hospitals, but this was not possible for several reasons. First, many studies did not use a pure control group. For example, some studies of NRT for hospitalized patients gave the placebo group counseling, self-help literature, etc. In many cases, the difference between NRT and placebo was insignificant if both groups were provided with counseling and follow-up. Second, the populations studied differed in their reasons for hospitalization. For example, some studies included only cardiac

patients, while others excluded cardiac patients. Most important, the interventions used were very heterogeneous.

The highest quit rates were found in two studies of cardiac patients.[28, 29] The high rates may have occurred because the immediacy of the situation was apparent to the patients; however, the reported rates may be biased upward, and there was no biochemical confirmation of smoking cessation. In studies where cotinine or carbon monoxide was used to verify self-reports (most other studies), cessation rates were far below those reported in the two studies that relied solely on self-reports. In general, interventions with follow-up calls or visits were shown to be more successful than those without, except in one study.[30]

Free-standing smoking cessation programs

There are very few inpatient or residential programs designed specifically for smoking cessation. In Minnesota, both Hazelden and the Mayo Clinic have such programs, but we found no controlled studies of them. Thus, we can not make a statement about the effectiveness of such programs. The only study we found of outpatient smoking cessation clinics was a randomized trial, but there was no pure control group.[31]

QUESTION 11. WHO IS MOST EFFECTIVE IN DELIVERING SMOKING CESSATION INTERVENTIONS?

We identified one systematic review that assessed nursing interventions specifically, and two meta-analyses that assessed the relative effectiveness of different providers. We also conducted our own meta-regression analysis focussing on the relative effectiveness of different providers.

In summary, the data support that many types of providers are effective. In two of three comparative meta-analyses, physician providers compared to non-physician providers had a

higher estimated odds ratio of effectiveness, and in one synthesis this difference was statistically significant.

QUESTION 12. DO CERTAIN INTERVENTIONS WORK BETTER FOR SPECIAL POPULATIONS?

We found only one controlled trial of smoking cessation interventions designed specifically for Latinos. Unfortunately, only two participants (one in the control group, one in the intervention) demonstrated cotinine-validated abstinence at both post-treatment and 12-month follow-up. More controlled trials of smoking cessation interventions for Latinos are necessary before we can make a statement on effectiveness.

We found five studies on African American population, only one of which showed statistically significant improvements in smoking cessation. We found no studies that demonstrate reduced or enhanced effectiveness of generic smoking cessation interventions among different ethnic/racial groups.

QUESTION 13 & 14. COSTS AND COST EFFECTIVENESS OF INTERVENTIONS

This section will discuss the cost and cost-effectiveness of different interventions studied in this review, including counseling, self-help, and mass media. It is important to note that medication costs are sometimes combined with these various interventions. The following table lists the average wholesale cost per dose and cost per day for these medications.[33]

Costs of Smoking Cessation Medications

(average wholesale price)

Medication	Cost per Dose	Cost per Day
Nicotine patch	$3 each	$3.00
Nicotine inhaler	$1/10mg	$1.50
OTC Nicotine gum	$0.50/piece	$5.00
Bupropion	$1.40/150-mg pill	$2.80
Clonidine*	$0.25/0.2-mg pill	$0.50

* not FDA-approved for smoking cessation

The available evidence suggests that smoking cessation interventions are highly cost-effective when compared with other medical treatments and prevention programs.[18, 34] The widely held view of smoking cessation as the "gold standard" of healthcare cost-effectiveness is underscored by the fact that even the least cost-effective smoking intervention — the use of nicotine gum as an adjunct to physician counseling — is estimated to cost less than half the median cost per life-year saved of nearly 600 life-saving interventions.[35]

We reviewed 15 published studies examining the cost-effectiveness (C/E) of various smoking cessation programs and three review articles. Eight of the cost-effectiveness analyses (CEA) were medical practice-based and seven were community-based interventions. In general, community-based programs tended to be less cost-effective than practice-based interventions. Further, practice-based interventions generally applied more rigorous methodologies such as randomized clinical trials. All of the studies reviewed examined adult smokers, yet none solely targeted the elderly.

All of the studies reviewed saved life-years at a cost as low as several hundred dollars to a high of $14,000, with a median value of about $5,000 per life year saved. These findings are well below the estimates of most other health interventions. The principal shortcoming of this

literature is a lack of evidence on the effectiveness of smoking cessation programs for specific patient subgroups -- such as the elderly -- and their preferences for specific interventions. As Warner[34] noted, different interventions are effective for different people. A resource-intensive treatment may be cost effective for smokers who do not respond to less-intensive programs, but may not be successful for smokers attempting to quit for the first time. Further investigation is needed to determine the cost-effectiveness of various smoking cessation interventions on specific patient populations.

LIMITATIONS

The primary limitation of the present systematic review—a limitation that is common to all such reviews—is the quantity and quality of the original studies. The studies we examined are extremely heterogeneous in terms of both the interventions tested and the specific populations or health care systems being studied. Furthermore, many of the study-level variables are highly idiosyncratic and intercorrelated (e.g., a study of patient education with nurses may also be a study of NRT in low-income African Americans). The correlation between intervention-level variables and population makes the assessment of the effects of the individual components challenging.

In addition, this study assumes that interventions will be as successful when targeted toward adults 65 years of age or older as when targeted toward younger populations. We had insufficient data to empirically test this assumption.

CONCLUSIONS

1. Individual, telephone, and group counseling are all effective, with individual counseling being possibly most effective.

2. There is consistent evidence from multiple analyses that greater intensity of counseling yields higher smoking cessation rates.

3. Nicotine replacement therapy (NRT), clonidine, and bupropion are all effective as pharmacotherapy for smoking cessation, although clonidine is not approved by the FDA for this use.

4. Patients visiting physicians trained in smoking cessation had higher cessation rates than those visiting untrained physicians.

5. Health insurance benefits of 100% for both counseling and NRT produced the greatest number of quitters in a population.

6. There is good evidence that both medical and non-medical providers are effective at delivering smoking cessation services, but conflicting evidence about the relative degree of effectiveness between provider types.

7. Interventions with follow-up calls or visits are more effective than those without.

8. There are insufficient data to support or refute variations on smoking cessation interventions among special populations.

RECOMMENDATIONS

Recommendations based on the evidence were formulated by a panel of experts on smoking cessation, health services research, medicine, and behavior change. The body of the report contains a list of these experts.

1. Smoking cessation interventions should be tested as a Medicare benefit.

2. Any demonstration project should include pharmacotherapy, physician visit, and/or telephone hotline. Group counseling should not be required, as most older smokers will avoid groups.

3. Primary care practitioners participating in smoking cessation demonstrations should be offered and encouraged to have training in this area.

4. There is no evidence that paying providers for outcomes will work, and there is considerable evidence that it will not. However, providers should be held accountable for their performance in accordance with the Public Health Service clinical practice guideline.[18] The five As (ask, advise, assess, assist, and arrange) should be documented in provider records.

5. As in any demonstration project, sufficient numbers of minorities and women should be included.

INTRODUCTION

Smoking is the single most preventable cause of morbidity and mortality in the United States. Smoking is a major risk factor for cardiovascular disease, chronic obstructive pulmonary disease, cancer, hypertension, diabetic complications and osteoporosis.[1, 2] Tobacco use causes more than 430,000 deaths, and costs the United States between $50 and $73 billion in medical expenses each year.[3, 4]

In 1995, 47 million U.S. adults 18 years of age and older reported that they were current smokers. Approximately 70% of current smokers expressed their desire to quit smoking completely, while almost 46% reported they had stopped smoking for at least one day in the preceding 12 months.[5]

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Zhang and colleagues estimated that smoking-related illnesses accounted for about $14.2 billion in Medicare expenditures in 1993, about 9.4% of Medicare's total budget. More specifically, smoking accounted for 11.4% of hospital care, 11.3% of nursing home care, 5.9% of home health care, and 5.6% of ambulatory care.[7] It is estimated that between 1995 and 2015, tobacco-related diseases will cost Medicare about $800 billion.[8]

There are significant benefits to smoking cessation, even after 30 or more years of regular smoking.[9] Data from the Established Population for the Epidemiological Study of Elderly (EPESE) indicate that smokers who quit have cardiovascular mortality rates similar to those of nonsmokers, and that this benefit is unrelated to age or the time elapsed since cessation.[10] In one study, older smokers who already had coronary artery disease improved their survival and risk of heart attack by quitting.[11] In addition, according to Tell,[12] lung function and circulation begin to improve immediately after cessation. A person who smokes more than 20 cigarettes per day and who quits at age 65 can expect to increase his or her life expectancy by 2 to 3 years.[13] Quitting smoking also greatly increases the quality of life for seniors.

Unfortunately, older smokers may be less likely to perceive the health consequences of smoking. For example, according to a recent survey of members of the American Association of Retired Persons (AARP), 47% of smokers age 50 and over did not believe that quitting could improve their health. In addition, 45% did not believe that continuing to smoke could further damage their health.[14] Still, older smokers are more likely to achieve success in their cessation attempts than younger smokers are.[15, 16] Thus, although special emphasis needs to be applied in addressing the barriers to quitting among the elderly, age is not a significant obstacle to cessation interventions.

A number of interventions to improve smoking cessation have been studied, and many of these are recommended in clinical practice guidelines promulgated by various organizations.[17] To better understand such interventions in the Medicare population, the Health Care Financing Administration (HCFA), as part of its Healthy Aging project, commissioned an evidence-based systematic review of smoking cessation, the results of which are detailed in this report.

METHODS

We synthesize evidence from the scientific literature on effectiveness of smoking cessation programs, using the evidence review and synthesis methods of the Southern California Evidence Based Practice Center, an Agency for Healthcare Research and Quality designated center for the systematic review of literature on the evidence for benefits and harms of health care interventions. Our literature review process consisted of the following steps:

- Develop a conceptual model (also sometimes called an evidence model or a causal pathway).[36]
- Identify sources of evidence (in this case, sources of scientific literature).
- Identify potential evidence.
- Evaluate potential evidence for methodological quality and relevance.
- Extract study-level variables and results from studies meeting methodologic and clinical criteria.
- Synthesize the results.

The following are broad categories of interventions that can be used to promote smoking cessation among persons age 65 or older:

- self-help
- counseling
- pharmacotherapy
- education
- financial incentives – provider and patient
- regulatory and legislative interventions
- media campaigns.

These interventions are described below.

Self-help. In self-help interventions, a patient uses provided instructional materials to help himself/herself stop smoking.

Counseling. Counseling can be in person or via telephone, in individual or group therapy. Providers include peer counselors, social workers, psychologists, and psychiatrists. Medical doctors also often provide brief counseling.

Pharmacotherapy. Nicotine replacement therapy (NRT) can be administered by chewing gum, nasal spray, or transdermal patch. Clonidine, antidepressants, anxiolytics, and mecamylamine have also been prescribed in efforts to curtail patients' smoking.

Education. Patients may be educated in person or through the mail, by pamphlets, peer educators, newsletters, audiovisual materials, computers, or electronic publications. Providers can be educated about smoking cessation interventions by attending workshops, training sessions, or lectures.

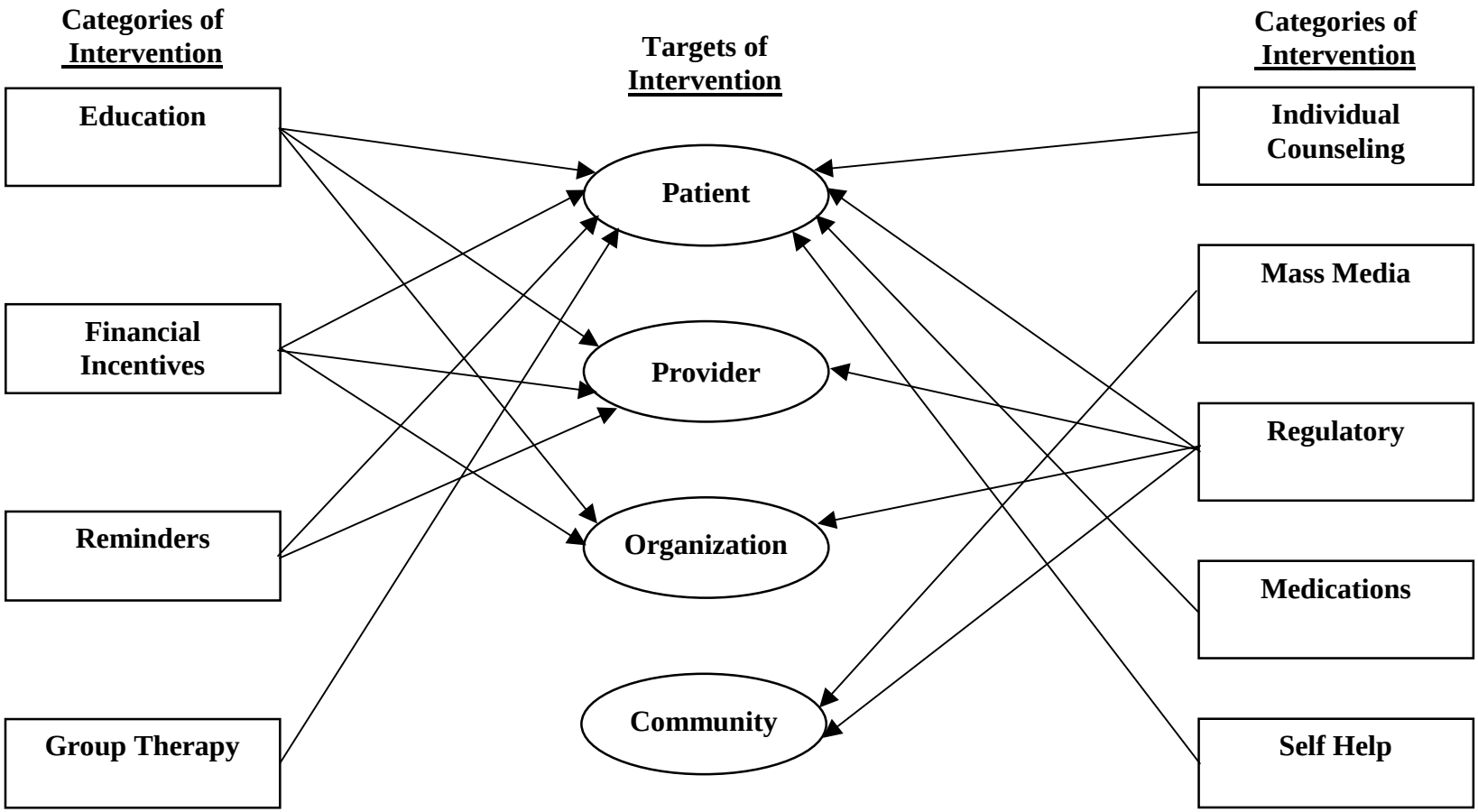
Financial incentives. Direct or indirect financial reward or benefit can be tied to a specific action on the part of a patient or provider. For example, patient insurance payments may be reduced, or gifts can be offered as a reward for biochemical confirmation of abstinence from tobacco.

Regulatory and legislative initiatives. Regulatory and legislative initiatives may operate on the local, state, or national level by creating new incentives or barriers that shape behavior. The most common policy changes include smoke-free workplaces and increased taxes on tobacco products.

Media campaigns. Media campaigns reach great numbers of people, through television, radio, newspapers, and billboards.

The relationships of these broad categories of interventions to the potential targets of smoking cessation interventions (patient, provider, organization, and community) are shown in Figure 1.

Figure 1. Conceptual Model



IDENTIFICATION OF LITERATURE SOURCES

We used the sources described below to identify existing research and potentially relevant evidence for this report.

COCHRANE COLLABORATION

The Cochrane Collaboration is an international organization that helps people make well-informed decisions about health care by preparing, maintaining, and promoting the accessibility of systematic reviews on the effects of heath care interventions. The Cochrane Library contains both a database of systematic reviews and a controlled-trials register. The library receives additional material continuously to ensure that reviews are maintained through identification and incorporation of new evidence. The Cochrane Library is available on CD-ROM, by subscription.

The Cochrane Tobacco Group maintains a database (held in Reference Manager) of over 2,000 citations on tobacco cessation. About 1,300 report on controlled trials or other types of evaluations of interventions. Other references are held for their potential as background material. The search terms used by the Cochrane Tobacco Group are reproduced in Table 1. (Cochrane Library, 1999).

Table 1. Literature Search Terms Used by the Cochrane Tobacco Group

Medline

SMOKING CESSATION
"SMOKING-CESSATION"/ all subheadings
"TOBACCO-USE-DISORDER"/ all subheadings
"TOBACCO"/ all subheadings
"NICOTINE"/ all subheadings
"TOBACCO,-SMOKELESS"/ all subheadings
"SMOKING"/ prevention-and-control , therapy
(QUIT* or STOP* or CEAS* or GIV*) near SMOKING
#1 or #2 or #3 or #4 or #5 or #6 or #7 or #8
"SMOKING"/ all subheadings
#10 not #9
PT=RANDOMIZED-CONTROLLED-TRIAL
PT=CONTROLLED-CLINICAL-TRIAL
RANDOMIZED-CONTROLLED-TRIALS
RANDOM-ALLOCATION
DOUBLE-BLIND-METHOD
SINGLE-BLIND-METHOD
#12 or #13 or #14 or #15 or #16 or #17
PT=CLINICAL-TRIAL
explode CLINICAL-TRIALS / ALL
(CLIN* near TRIAL*) in TI
(CLIN* near TRIAL*) in AB
PLACEBOS
PLACEBO* in TI
PLACEBO* in AB
RANDOM* in TI
RANDOM* in AB
RESEARCH-DESIGN
(SINGL* or DOUBL* or TREBL* or TRIPL*) near (BLIND* or MASK*)
(#29 in TI) or (#29 in AB)
(VOLUNTEER* or PROSPECTIV*) in TI
(VOLUNTEER* or PROSPECTIV*) in AB
#19 or #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27 or #28 or #30 or #32
explode "EVALUATION-STUDIES"/ all subheadings
explode "CROSS-SECTIONAL-STUDIES"/ all subheadings
"PROSPECTIVE-STUDIES"
"RETROSPECTIVE-STUDIES"
"FOLLOW-UP-STUDIES"
#34 or #35 or #36 or#37 or #38
explode "HEALTH-EDUCATION"/ all subheadings
explode "HEALTH-BEHAVIOR"/ all subheadings
explode "COMMUNITY-HEALTH-SERVICES"/ all subheadings
"HEALTH-PROMOTION"/ all subheadings

Table 1 (continued)

explode "BEHAVIOR-THERAPY"/ all subheadings
#40 or #41 or #42 or #43 or #44
#18 or #33 or #39 or #45
(TG=ANIMAL) not ((TG=HUMAN) and (TG=ANIMAL))
#46 not #47
#48 and #9 (First part of search - uses core smoking related terms, for maximum specificity)
#48 and #11 (Second part of search - highly sensitive, low specificity)

An updated search of PsycLIT (Psychological Abstracts - American Psychological Association) was developed and run retrospectively.

Updated PsycLIT search on Silverplatter ASCII3:
#1 SMOKING CESSATION
#2 ANTISMOKING or ANTI-SMOKING
#3 QUIT* or CESSAT*
#4 ABSTIN* or ABSTAIN*
#5 CONTROL* NEAR SMOK*
#6 explode "BEHAVIOR-MODIFICATION"
#7 #2 or #3 or #4 or #5 or #6
#8 PREVENT*
#9 "TOBACCO-SMOKING" OR SMOK* OR CIGAR* OR TOBACCO*
#10 #7 and #9
#11 #8 and #9
#12 #1 or #10 or #11

Dissertation Abstracts Online:
1 SMOKING ADJ CESSATION
2 SMOKING OR CIGARETTE$1 OR TOBACCO
3 RANDOMIS$ OR RANDOMIZ$ OR (RANDOM ADJ ALLOCATS) OR (DOUBLE ADJ BLIND$1)
4 PROSPECTIVE ADJ (STUDY OR STUDIES)
5 TRIAL$1
6 2 AND (3 4 5)
7 1 OR 6

Applied Social Sciences Index & Abstracts (ASSX)
8 SMOKING ADJ CESSATION
9 SMOKING
10 RANDOMIS$ OR RANDOMIZ$ OR TRAIL$1 OR (RANDOM ADJ ALLOCATS)
11 DOUBLE ADJ BLIND
12 PROSPECTIVE ADJ (STUDY OR STUDIES)
13 9 AND (10 11 12)
14 8 OR 13

Social Citations Index (SCI) and Social Science Citations Index (SSCI):
SMOK* & (CESSAT* OR TRIAL* OR RANDOMI* OR PROSPECTIVE OR BLIND)

SMOKING CESSATION GUIDELINES

The Agency for Healthcare Research and Quality (AHRQ, formerly the Agency for Health Care Policy and Research, AHCPR) developed guidelines for smoking cessation in 1996. An advisory panel employed an explicit science-based methodology and expert clinical judgement to develop specific statements on smoking cessation interventions. Critical reviews and syntheses were used to evaluate empirical evidence and outcomes. More recently, the Public Health Service (PHS) has published a document, Treating Tobacco Use and Dependence, which evaluates literature from 1975 to 1999.[18] These findings were released in June 2000. We were provided with the list of references used in both analyses, and we ordered the documents not already in our possession. In preparing the Public Health Service clinical practice guideline, more than 50 meta-analyses were performed on type of counseling (phone, individual, group), length of counseling, intensity of program, etc. These analyses were not stratified by age.

PREVIOUS SYSTEMATIC REVIEWS

We identified 10 previously completed systematic reviews relevant to this project from our personal files (see Table 2). Each review discusses one or more interventions aimed at smoking cessation. We retrieved all relevant documents referenced in these publications.

Table 2. Previous Systematic Reviews

Cepeda-Benito A. Meta-analytical review of the efficacy of nicotine chewing gum in smoking treatment programs. *J Consult Clin Psychol.* 1993;61:822-30.

Covey LS, Glassman AH. A meta-analysis of double-blind placebo-controlled trials of clonidine for smoking cessation. *Br J Addict.* 1991;86:991-8.

Curry SJ. Self-help interventions for smoking cessation. *J Consult Clin Psychol.* 1993;61:790-803.

Fiore MC, Smith SS, Jorenby DE, Baker TB. The effectiveness of the nicotine patch for smoking cessation. A meta-analysis. *JAMA.* 1994;271:1940-7.

Fisher EB Jr., Lichtenstein E, Haire-Joshu D, Morgan GD, Rehberg HR. Methods, successes, and failures of smoking cessation programs. *Annu Rev Med.* 1993;44:481-513.

Kottke TE, Battista RN, DeFriese GH, Brekke ML. Attributes of successful smoking cessation interventions in medical practice. A meta-analysis of 39 controlled trials. *JAMA.* 1988;259:2883-9.

Pederson LL. Compliance with physician advice to quit smoking: A review of the literature. *Prev Med.* 1982;11:71-84.

Silagy C, Mant D, Fowler G, Lodge M. Meta-analysis on efficacy of nicotine replacement therapies in smoking cessation. *Lancet.* 1994;343:139-42.

Skaar KL, Tsoh JY, McClure JB, et al. Smoking cessation. 1: An overview of research. *Behav Med.* 1997;23:5-13.

Ward KD, Klesges RC, Halpern MT. Predictors of smoking cessation and state of the art smoking interventions. *The Journal of Social Issues.* 1997;53:129-45.

HEALTH CARE QUALITY IMPROVEMENT PROJECTS (HCQIP)

Each U.S. state and territory is associated with a Medicare Peer Review Organization (PRO) that conducts various research projects. HCFA maintains a database with a narrative description of each research project, called a Narrative Project Document (NPD). An NPD includes the aims, background, quality indicators, collaborators, sampling methods, interventions, measurement, and results of a project. We searched the NPD database for studies on smoking cessation. This

search retrieved only two NPDs, reflecting the lack of smoking intervention trials in the Medicare population.

SUPPLEMENTAL LIBRARY SEARCH

The Cochrane Library database contains records of studies published up to June 1997. We conducted a search of literature published since that date, using the terms used by the Cochrane Tobacco Group (Table 1), and we acquired copies of all relevant articles not already obtained through the sources mentioned above.

EVALUATION OF POTENTIAL EVIDENCE

We reviewed the articles retrieved from the literature sources against exclusion criteria to determine whether to include them in the evidence synthesis. We created a one-page screening review form that contains a series of yes/no questions (Figure 2). After evaluation against this checklist, each article was either accepted for further review or rejected. A physician and a psychologist, each trained in the critical analysis of scientific literature, independently reviewed each study, abstracted data, and resolved disagreements by consensus. Dr. Erin Stone (the co-principal investigator of this study) resolved any disagreements that remained unresolved after discussions between the reviewers. Project staff entered data from the checklists into an electronic database that was used to track all studies through the screening process.

While we were searching primarily for data relevant to the Medicare population, we included studies containing data on populations under age 65 to avoid loss of potentially useful data. (We did exclude studies on adolescents and pregnant women, for obvious reasons.) The studies had to measure quit rates at least five months after the start of the intervention. To be accepted at this stage, a study had to use one of the following study designs: randomized controlled trial,

controlled clinical trial, controlled before and after study, or interrupted time series with adequate data points. We defined the study types according to the criteria described below.

Randomized controlled trial (RCT). A trial in which the participants (or other units) are definitely assigned prospectively to one or two (or more) alternative forms of health care, using a process of random allocation (e.g., random number generation, coin flips).

Controlled clinical trial (CCT). A trial in which participants (or other units) are either:

a) Definitely assigned prospectively to one or two (or more) alternative forms of health care using a quasi-random allocation method (e.g., alternation, date of birth, patient identifier),

OR

b) Possibly assigned prospectively to one or two (or more) alternative forms of health care using a process of random or quasi-random allocation.

Controlled before and after study (CBA). A study in which the intervention and control groups become involved in the study in a way other than by random process and in which the baseline period of assessment is included in the main outcomes. We used two minimum criteria for inclusion of CBAs in the review:

a) Contemporaneous data collection – data on the pre- and post-intervention periods for the study and control sites are the same,

b) Appropriate choice of control sites – the study and control sites are comparable with respect to dominant reimbursement system, level of care, setting of care, and academic status.

Interrupted time series (ITS). An ITS study examines data trends and attributes a change in trend to an intervention. Such studies can be either retrospective or prospective. We used two minimum criteria for inclusion of ITS designs in the reviews:

a) A clearly defined point in time at which the intervention occurred.

b) At least three data points before and three data points after the intervention.

Following these restrictions on study design, we excluded studies that employed a simple pre/post design (i.e., a study design in which an intervention is administered to providers, patients, or communities, and the proportion of persons receiving the service is recorded once before and once after the intervention). Such a study design has no control group; therefore, it cannot account for temporal effects unrelated to the intervention.

Figure 2. Screening Form
Topic = SMOKING CESSATION
HCFA - Healthy Aging Evidence Report #2

Reject Code

1. Article ID Topic :

2. First Author ____ ____ ____ ____ ____ ____ ____ ____
(First 8 character of first author's last name)

3. Reviewer _____

4. Subject of article:
   - Smoking cessation 1
   - Other 9

(IF OTHER, REJECT - STOP)

5. Study Design:
   - RCT 1
   - CCT 2
   - CBA 3
   - ITS 4
   - Other 9

(IF OTHER, REJECT - STOP)

6. Age:
   - 65 years and over only 1
   - Under 65 and over 65 2
   - Adults under 65 only 3
   - Not adult (e.g. teenager) 4
   - Other (specify:_____) 9

(IF OTHER OR NOT ADULT, REJECT - STOP)

7. If under 65 and over 65:
   Are the results split out by these age groups?

   - Yes 1
   - No 2

8. Country of subjects:
   - USA 1
   - Other 9

9. Was smoking cessation assessed by:
   - Patient report 1
   - Biochemical confirmation (e.g. thiocyanate, cotinine, nicotine, carboxyhemoglobin levels) 2
   - 3rd party 3
   - Other (specify:_____) .. 9

10. Number of months after treatment that LAST follow-up occurred:
    - Less than one month 0
    - One 1
    - Two 2
    - Three 3
    - Four 4
    - Five 5
    - Six 6
    - Seven 7
    - Eight 8
    - Nine 9
    - Ten 10
    - Eleven 11
    - Twelve 12
    - More than 12 (specify: ____ ____ ____ months)

EXTRACTION OF STUDY-LEVEL VARIABLES AND RESULTS

We abstracted data from the relevant articles on a specialized form (see Figure 3). The form contains questions about the study design; the number and characteristics of the patients; the setting, location, and target of the intervention; the intensity of the intervention; the types of outcome measures; the time from intervention until outcome measurement; and the results. We selected the variables for abstraction with input from the project's technical experts. A physician and a psychologist, working independently, extracted data in duplicate and resolved disagreements by consensus. A senior physician resolved any disagreements not resolved by consensus.

To evaluate the quality of the study, we collected information on the study design (with the hierarchy of internal validity being RCT, CCT, CBA, and ITS), withdrawal/dropout rate, and agreement between the unit of randomization and the unit of analysis. We did not use blinding and concealment of allocation,[37] because those techniques were not feasible in many studies of smoking cessation interventions. The primary outcome consisted of the proportion of clients who quit smoking in the control and intervention groups. Many studies confirmed quit rates biochemically by measuring breath carbon monoxide, saliva cotinine, or serum thiocynate. If confirmed numbers were unavailable, we extracted self-report data.

Figure 3. Abstraction Form
Smoking - HCFA-Healthy Aging - Evidence Report #2

1.	Article ID: ___ ___ ___ ___ ___	ID 1-5
2.	Study number within ID: ___ ___	SUBID 6-7
	Describe: _____	CARD 01
3.	First Author: ___ ___ ___ ___ ___ ___ ___ ___	10-17
4.	Reviewer: _____	
5.	Date of publication: 1 9 ___ ___	18-19

6. Are any vulnerable populations specifically included?

	Yes	No	
Persons 85 and older	1	2	20
African-Americans	1	2	21
Hispanic	1	2	22
Other minority populations	1	2	23
Low-income populations	1	2	24
Nursing home	1	2	25
Pregnant women	1	2	26
Other (specify:_____)	1	2	27

7. Target of the intervention:

	Yes	No	
Patients	1	2	28
Providers	1	2	29
Organizations	1	2	30
Community other geographic area	1	2	31

8. If PROVIDER is targeted, what best characterizes the provider type?

	Yes	No	
Physicians	1	2	32
Nurses	1	2	33
Dentist	1	2	34
Pharmacist	1	2	35
Psychologist	1	2	36
Counselor	1	2	37
Social Worker	1	2	38
Other (specify:_____)	1	2	39
Provider is not target	1		40

9. What is the setting of the intervention? 41

Academic setting	1
Non-academic setting	2
Both academic and Non-academic setting	3
Not sure	4

10. What is the geographic setting of the intervention? 42

Mainly rural	1
Mainly urban/suburban	2
Mixed rural/urban/suburban	3
Not sure	4

11. In what health-care practice settings did the intervention occur? 43

Hospital	1
Outpatient, clinic/program	2
Outpatient, w/primary-care physician	3
Outpatient, not P-C physician	4
Outpatient, other (specify _____)	5
Both hospital and outpatient	6
Nursing home	7
Not applicable	9

12. What best describes the reimbursement system of the care in which the intervention occurred? 44

Fee-for-service	1
HMO	2
Managed care, not HMO	3
Mixed reimbursement systems	4
Other (specify:_____)	5
Not applicable	9

13. Comorbid conditions/other cessation-affecting factors:

	Included	Excluded	Neither	
High nicotine dependence	1	2	3	45
Proximity to other smokers	1	2	3	46
High stress level	1	2	3	47
Concern about weight gain	1	2	3	48
Psychiatric comorbidity	1	2	3	49
Other (specify:_____)	1	2	3	50

Figure 3: Abstraction Form (continued)
Smoking - HCFA-Healthy Aging Evidence Report #2

14. What was the unit of allocation? 51
Patient 1
Provider 2
Organization 3
Community or geographic area 4
Not applicable 9

15. What was the unit of analysis? 52
Patient 1
Provider 2
Organization 3
Community or geographic area 4
Not applicable 9

16. If the unit of allocation and the unit of analysis are not the same, was any statistical correction made for clustering? 53
Yes 1
No 2
Not applicable 9

17. Was there a sample-size justification or power calculation? 54
Yes 1
No 2

18. What outcomes were measured? 55
Proportions/percents 1
Other ..... 2 **(If Other, give to Erin)**

19. When were the outcomes last measured relative to after the start of the intervention? 56-58

___ ___ ___ weeks

20. Were costs analyzed? 59
Yes ..... 1 **(If Yes, give to Erin)**
No 2

21. Is this a crossover study? 60
Yes 1
No 2

Figure 3: Abstraction Form (continued)
Smoking - HCFA-Healthy Aging Evidence Report #2

GROUP 1 / 2 / 3 / 4 / 5 (Complete this page for each intervention arm)
Description of group (optional): _____

23. What best characterizes the intervention for this group?

Description of Intervention	X	Intensity	Duration	# Times	Medium	Content
01 Control/Usual Care/No intervention						
02 Education without detailing/outreach						
A Patient						
B Provider						
03 Detailing						
04 Provider feedback						
05 Financial/administrative intervention						
A Patient						
B Provider						
C Organization						
06 Reminders						
A Patient						
B Provider						
07 Group therapy/counseling						
A Leader trained						
B Leader not trained						
08 Individual counseling						
09 Mass media/community intervention						
10 Regulatory						
A Patient						
B Provider						
C Organization						
11 Medications		Dose (mg)	Duration days	Times/Day		
A Nicotine Replacement						
1 Gum						
2 Patch						
3 Nasal spray						
B Clonidine						
C Antidepressants						
D Anxiolytics						
E Mecamylamine						
F Other drug ( )						
12 Self-help						
13 Organizational (process) change						

ID 1-5
SUBID 6-7
CARD 02

24. Does the intervention include any of the following?

	Yes	No	
Social influence	1	2	10
Marketing/Outreach	1	2	11
High visual appeal/clarity	1	2	12
Collaboration, teamwork	1	2	13
Design based on needs, barriers, incentives, assessments, or theory	1	2	14
Top management support	1	2	15
Active learning strategies	1	2	16

25. How many patients were…

Enrolled ___ ___ ___ , ___ ___ ___ 17-22

Followed ___ ___ ___ , ___ ___ ___ 23-28

Figure 3: Abstraction Form (continued)
Smoking - HCFA-Healthy Aging Evidence Report #2

Describe the outcomes:

SMOKING CESSATION

Group	Percent not smoking before intervention	Percent not smoking after intervention	Sign (< = >)	p-value	Comparison group	ID 1-5 SUBID 6-7 CARD 07
1	___ ___ ___ . ___	___ ___ ___ . ___	___	___ . ___ ___ ___ ___	___	10-24
			___	___ . ___ ___ ___ ___	___	25-31
2	___ ___ ___ . ___	___ ___ ___ . ___	___	___ . ___ ___ ___ ___	___	32-46
			___	___ . ___ ___ ___ ___	___	47-53
3	___ ___ ___ . ___	___ ___ ___ . ___	___	___ . ___ ___ ___ ___	___	54-68
			___	___ . ___ ___ ___ ___	___	69-75
4	___ ___ ___ . ___	___ ___ ___ . ___	___	___ . ___ ___ ___ ___	___	76-90
			___	___ . ___ ___ ___ ___	___	91-97
5	___ ___ ___ . ___	___ ___ ___ . ___	___	___ . ___ ___ ___ ___	___	98-112
			___	___ . ___ ___ ___ ___	___	113-119

Figure 3: Abstraction Form (continued)
Smoking - HCFA-Healthy Aging Evidence Report #2

ADDITIONAL INSTRUCTIONS

Intensity: Length of time in minutes for each unit of intervention, e.g. 60 minute educational session, 1 minute TV spot, 5 minute counseling session.
Duration: Length of time in days from start of intervention to end of intervention. E.g. TV spots ran for 15 days, educational session occurred only once (1 day), nicotine replacement therapy given for 4 weeks (28 days).
Number of units of intervention: Number of times the intervention occurred for each target. E.g. 1 counseling session each week for 5 weeks for each patient (5 units), 2 reminders sent to each patient (2 units), 1 brochure given to each patient (1 unit).
Medium/Delivery vehicle of intervention. Write down number(s) from list below (3 numbers max):

1. In person
2. By telephone
3. In group
4. Radio
5. Broadcast TV
6. Billboard
7. Electronic
8. Video
9. Internet (web site)
10. Poster
11. Mail
12. Other
13. Printed material (e.g. newsprint, brochure, computer printout)
14. Other Visual Display

Content: Was there mention that the content was tailored to the audience (e.g. ethnically sensitive billboard)? Write **Y** for Yes and **N** for No.

EXPERT PANEL REVIEW OF EVIDENCE REPORT

We presented the draft evidence report to a panel of experts (Table 3) for feedback and discussion on October 21, 1999. During this meeting, we reviewed our methods and preliminary results. We also presented draft models for smoking cessation demonstration projects in fee-for-service and managed-care settings. Feedback from the expert panel was useful in fine-tuning both our analysis and our proposed intervention demonstration projects.

Table 3. Expert Panel

Susan Curry, Ph.D.
Associate Director
Center for Health Studies
Group Health Cooperative of Puget Sound

Michael Fiore, M.D., M.P.H.
Professor of Medicine
Director, Center for Tobacco Research and Intervention
University of Wisconsin
Expert Panel Chair

Jessie Gruman, Ph.D.
Executive Director
Center for the Advancement of Health

Jack Henningfield, Ph.D.
Vice President for Research and Health Policy
Pinney Associates

Jack Hollis, Ph.D.
Program Director
Epidemiology and Disease Prevention
Kaiser Permanente Center for Health Research

Richard Hurt, M.D.
Director
Nicotine Dependence Center
Mayo Clinic

Corrine Husten, M.D., M.P.H.
Medical Officer
Office of Smoking and Health
Center for Disease Control and Prevention

Carlos Roberto Jaen, M.D., Ph.D.
Associate Professor and Director
Center for Urban Research in Primary Care
Department of Family Medicine and Department of Social and Preventive Medicine
State University of New York at Buffalo

Robert Kaplan, Ph.D.
Professor
Family and Preventive Medicine
University of California, San Diego

Frederick Kviz, Ph.D.
University of Illinois at Chicago
School of Public Health

William Lawrence, M.D., M.S.
Director, Lombardi Cancer Clinical and Economics Outcomes Core
Georgetown University

Glenn Morgan, Ph.D.
Clinical Psychologist, Tobacco Control Research
National Cancer Institute

Deborah Ossip-Klein, Ph.D.
Director, Smoking Research Program
University of Rochester Cancer Center

Helen Halpin Schauffler, Ph.D.
Associate Professor of Health Policy
University of California, Berkeley
School of Public Health

Maxine Stitzer, Ph.D.
Professor, Department of Psychiatry and Behavioral Sciences
John Hopkins/Bayview Medical Center
Behavioral Biology Research Center

Victor Strecher, Ph.D.
Professor
Director, Department of Health
Behavior and Health Education
University of Michigan
Comprehensive Cancer Center

Kenneth Warner, Ph.D.
Professor
University of Michigan
Department of Public Health Policy and Administration, School of Public Health

Disclaimer: Participation as an Expert Panelist does not indicate consensus with the recommendations of this evidence report

STATISTICAL METHODS

Prior to our analysis, we entered all data on outcomes and interventions into the statistical program SAS.[38] In the analysis itself, we sought to answer a variety of questions specified by HCFA:

1. If Medicare were to offer a smoking cessation benefit, how would providers be reimbursed be reimbursed? For example, by minutes of counseling?
2. How useful is provider training?
3. How should provider compliance be measured and monitored?
4. What means could be used to curb overutilization? Cost sharing by patients? Annual caps on services?
5. How effective are patient financial incentives?
6. How effective is telephone counseling?
7. How effective is other counseling?
8. How effective is pharmacotherapy?
9. How effective is self-help?
10. Which practice settings are most effective? Outpatient? Hospital? Free-standing smoking cessation clinics?
11. Who is most effective at delivering smoking cessation interventions? Physicians? Psychologists? Nurses? Dentists?
12. Do certain interventions work better for special populations?
13. What are costs of interventions?
14. Which interventions are most cost-effective?

Some of these questions were similar or even identical to questions being assessed by the team leading the 2000 Public Health Service (PHS) clinical practice guideline on smoking cessation guidelines. However, the focus of this report was to draw inferences for Medicare programs and policies for an insurance benefit. Here we present the PHS analyses where applicable.[18]

Our summary of the evidence is both qualitative and quantitative. For many of the specific questions listed above, the evidence was too sparse and/or heterogeneous to support statistical pooling. In these cases, our summary of evidence is qualitative. For those questions that had sufficient information to support statistical pooling, we used meta-regression.

META-REGRESSION ANALYSIS

We first retrieved all studies that assessed the effects of an intervention or interventions relative to either a group that received usual care or a control group. We then fit a series of meta-regressions to these studies.[39] The basic data matrix for the meta-regressions was as follows. Each study with a single intervention arm contributed four observations corresponding to the cells of a two-by-two table of treatment by outcome (control and intervention cases that received the preventive or screening service; control and intervention cases that did not) to a weighted logistic regression that predicted cessation of smoking or no cessation. An observation's weight was equal to the number of individuals belonging to the corresponding cell. Studies that had more than one intervention contributed an additional pair of observations (those who did not and those who did receive the service in the intervention group, respectively) for each additional intervention. For example, a study that had three intervention arms contributed eight observations to the meta-regression: two for the control group, two for the first intervention, two for the second intervention, and two for the third intervention.

To assess the statistical significance of each type of intervention, or of the interaction between treatment and a particular covariate of interest—for example, whether intervening worked better for particular subpopulations—we constructed specific models that contained both an intervention component indicator or specific covariate-by-treatment interaction indicator and

indicator variables for each study. The inclusion of study indicators controlled for all measured study characteristics and all unmeasured ones and is akin to fitting a fixed-effects model. Each model produced odds ratios versus control or usual care for covariate-by-treatment interactions that are adjusted for all measured and unmeasured study-level differences.

COST EFFECTIVENESS

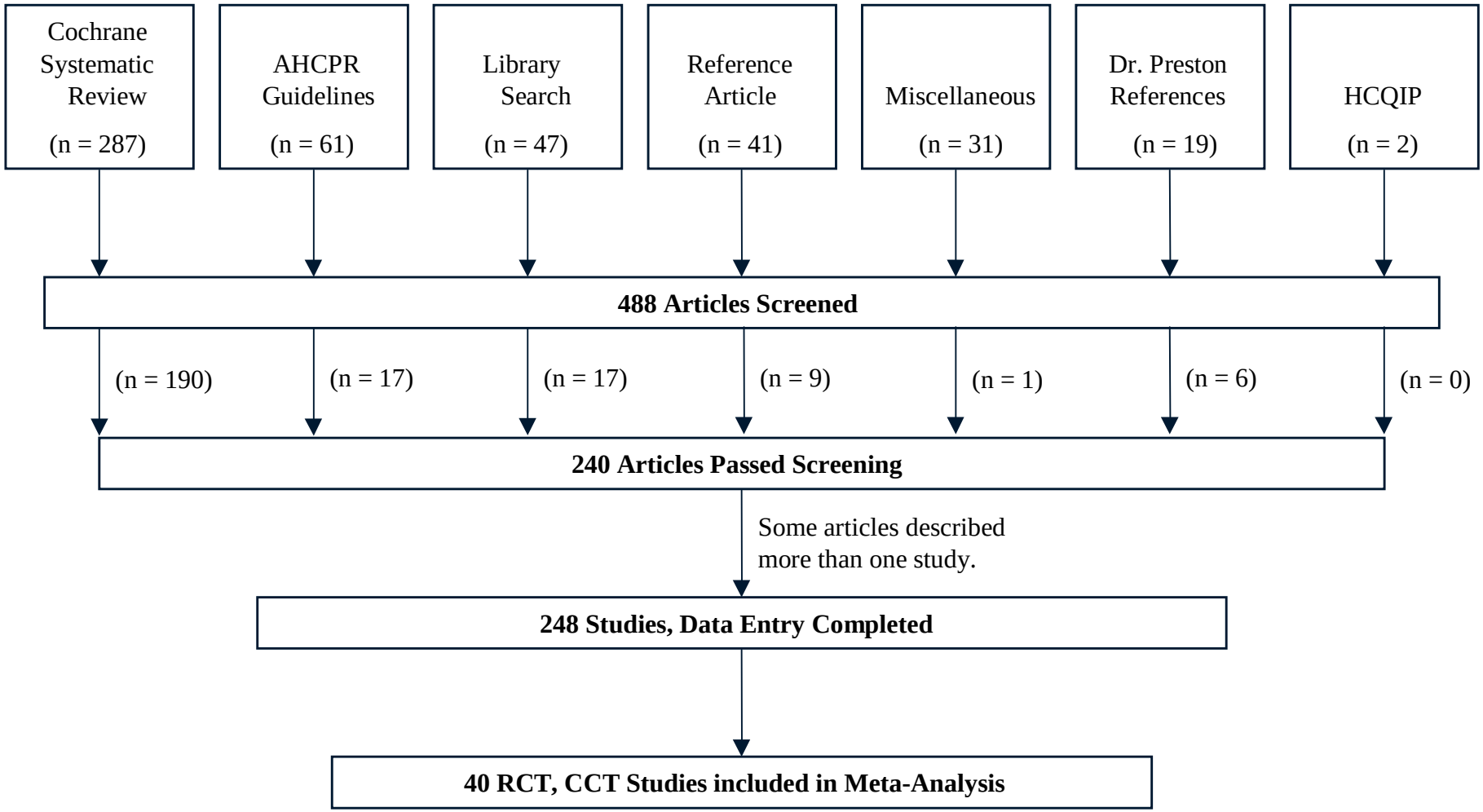
To assess the cost-effectiveness of the interventions, we first determined whether the studies included cost data. We chose to summarize these studies qualitatively because of heterogeneity.

RESULTS

IDENTIFICATION OF EVIDENCE

Figure 4 describes the flow of evidence from the original sources to final acceptance for our review. The Cochrane library contained 287 relevant articles, the Public Health Service clinical practice guideline[18] referenced 61 articles not contained in Cochrane, and 41 additional articles were referenced in previous reviews on smoking cessation. Dr. Jeanette Preston, Principal Investigator of our smoking cessation demonstration project, sent 19 additional articles. A final library search yielded 47 recently published articles that were not contained in the former sources. The database for the Health Care Quality Improvement Projects contained only two reports on smoking cessation. Finally, 31 miscellaneous articles were identified from nonreview article reference lists and through suggestions from experts in the field.

Figure 4. Flow of Evidence



DISTRIBUTION OF EVIDENCE

Table 4 presents the 248 studies we examined, stratified by service and broad characterization of intervention. Note that some studies addressed several interventions; therefore, the total sums to more than 248.

The intervention type that appeared in the greatest number of studies was patient education (149 studies), followed by individual counseling (118 studies). One-hundred four studies included self-help interventions, while 76 studies considered patient financial incentives. Once again, these categories were not mutually exclusive. For example, a patient could receive both education and group counseling simultaneously in a study. The number of interventions/arms ranged from one to nine; the average number of interventions was between two and three.

Table 4. Interventions by Type

Intervention	# of studies*
Education without detailing/ outreach	
Patient	149
Provider	31
Provider detailing	3
Provider feedback	1
Financial/administrative intervention	
Patient	76
Provider	2
Organization	1
Reminders	
Patient	33
Provider	15
Group therapy/ counseling	
Leader trained	52
Leader not trained	32
Individual counseling	118
Mass media, community intervention	6
Regulatory	
Patient	0
Provider	0
Organization	1
Medications	
Nicotine replacement	
Gum	74
Patch	36
Nasal Spray	9
Clonidine	6
Antidepressants	6
Anxiolytics	5
Mecamylamine	3
Other	21
Self-help	104
Organizational (process) change	8

* The numbers of studies in this column do not sum to the total number of articles because many studies use multiple interventions.

DESCRIPTION OF EVIDENCE

The tables in Appendix 1 present the following descriptive information for each study that met our acceptance criteria:

- The author, year, country of origin, and study design.
- The age and vulnerable population targeted in the study.
- The target of the intervention (patients, provider type, organizations, communities).
- The study's setting (academic or nonacademic), the geographic setting (urban/suburban or rural), and the setting's reimbursement system (HMO, fee-for-service, mixed).
- The interventions being compared (e.g., control versus patient education, provider reminder versus provider reminder plus patient education).
- The characteristics of the interventions (population size [N], baseline rate, and follow-up rate).
- The smoking cessation rate in the control and intervention groups.

QUALITY OF EVIDENCE

Of the 248 separate studies included in our analysis, 202 were randomized clinical trials (RCT), 32 were controlled clinical trials, 13 were controlled before/after studies, and 1 was an interrupted time series. Thus, the majority of studies used RCT, the study design with the strongest internal validity. Studies measured smoking cessation by patient self-report, by biochemical validation, or by both. We assessed with meta-regression whether use of self-report or biomedical validation was associated with bias in the estimated efficacy of interventions, controlling for other study-level variables. The adjusted odds ratio for all studies using biochemical validation was 2.62 (95% C.I.=2.38 to 2.87), while for self-report, the adjusted odds ratio was 2.48 (95% C.I.=2.21 to 2.78). Therefore, there is no evidence of bias in the estimate of efficacy as a function of method for measuring smoking cessation.

DESCRIPTION OF RESULTS

QUESTION 1. HOW SHOULD PROVIDERS BE REIMBURSED?

We found no direct evidence that any particular reimbursement system for providers is better than the others. (That is, there were no studies that compared smoking cessation outcomes as a function of different reimbursement schemes.) There did, however, appear to be a relationship between length of counseling time and smoking cessation outcomes. This is detailed in Question 6 below.

QUESTION 2. HOW USEFUL IS PROVIDER TRAINING?

A recent meta-analysis[19] found 11 studies of the effect of provider education on both provider performance and patient smoking cessation rates. Some of these studies, published from 1988 through 1996, were required to report smoking cessation rates of at least six months after the intervention period. Two articles reported updates on previously published articles, leaving nine separate studies to be analyzed. Eight of these studies reported the effect of training medical practitioners, and one reported the effect of training dental practitioners. All of the studies were conducted in North America. The provider training in all studies was conducted on a group basis, in either a tutorial or a workshop format. Various methods were employed, including videos, role-playing, discussion, and didactic lectures. The content for most of these educational interventions included setting quit dates and offering patient follow-up.

The results of this review showed that trained providers are significantly more likely to perform smoking-cessation tasks than untrained providers. Patient outcomes are also affected. Patients who saw trained providers were more likely to stop smoking than those who saw untrained providers (pooled odds ratio 1.48, 95% C.I.=1.20 to 1.83).

QUESTION 3. HOW SHOULD PROVIDER COMPLIANCE BE MEASURED AND MONITORED?

We found no studies in the medical literature that addressed the measuring and monitoring of provider compliance in smoking cessation interventions. Patient compliance was often measured by biochemical means such as serum cotinine, breath carbon monoxide, and thiocynate.

QUESTION 4 & 5. WHAT MEANS CAN BE USED TO CURB OVERUTILIZATION AND HOW EFFECTIVE ARE PATIENT FINANCIAL INCENTIVES?

One article studied effectiveness and cost-effectiveness of different levels of coverage for both a behavior modification benefit and a nicotine replacement benefit for smoking cessation. This study was performed at a health maintenance organization in the Pacific Northwest and involved over 90,000 patients.[20] The four benefit strategies are shown in Table 5.

Table 5. Cost-sharing Plans Analyzed

Plan	Behavior Benefit	Nicotine Replacement Benefit	Cost/ Quitter
Full	100%	100%	$1171
Standard	50%	100%	$797
Flipped	100%	50%	$870
Reduced	50%	50%	$801

The most cost-effective benefit plans (from the health plan perspective) were found to be those in which the patients bore some financial responsibility for the smoking cessation program. However, full coverage of both benefits resulted in more quitters (approximately two to four times as many quitters in the full benefit plan as in the reduced coverage plans).

We found no studies that specifically addressed curbing overutilization or the effect of capitation limits on services. Our expert panel emphasized that overutilization should not be a problem, and that we should concentrate on convincing smokers to engage in cessation interventions.

QUESTION 6 & 7. HOW EFFECTIVE IS TELEPHONE AND OTHER COUNSELING?

Individual counseling was statistically significantly superior to self-help (which was only marginally different than control). A number of systemic reviews have reported on various aspects of counseling for smoking cessation.[17, 18, 21-23] Results from a meta-analysis performed for the 2000 Public Health Service clinical practice guideline[18] show that all forms of counseling are statistically significantly effective at promoting smoking cessation. In the meta-analysis, individual counseling yielded the highest adjusted odds ratio for success, followed by group counseling, phone counseling, and self help. The greater effectiveness of individual counseling over telephone counseling approached statistical significance. There was no statistically significant difference in effectiveness between group counseling and telephone counseling. In another quantitative systematic review that examined only physician counseling,[21] 16 trials reporting the effect of brief advice on smoking cessation had a pooled odds ratio of 1.69 (95% C.I.=1.45 to 1.98). Intensive counseling was also found to be more effective than minimal advice, with a pooled odds ratio of 1.44 (95% C.I.=1.23 to 1.68).

A recent meta-analysis of five studies[23] found group counseling more effective than no intervention or minimal contact, with a pooled odds ratio of 1.91 (95% C.I.=1.20 to 3.04). In two trials that compared group counseling directly with individual counseling, there were no statistically significant differences between the two interventions.

The 1996 AHCPR systematic review[17] revealed an apparent dose-response curve between the amount of counseling and the smoking cessation rate. For contact less than or equal to three minutes, the adjusted odds ratio was 1.2 (95% C.I.=1.0 to 1.5), and for contact longer than 10 minutes, the adjusted odds ratio increased to 2.4 (95% C.I.=2.1 to 2.7). Counseling lasting between three and 10 minutes had an intermediate adjusted odds ratio of 1.4 (95% C.I.=1.2 to 1.7). Results from the Public Health Service clinical practice guideline show a similar trend.[18]

According to the guidelines, there is a similar relationship for the duration of individual counseling. Counseling with a duration of less than two weeks was found to be less effective than counseling that lasted more than eight weeks (adjusted odds ratio of 1.1 versus 2.7). Counseling lasting between two and eight weeks showed intermediate effectiveness (adjusted odds ratio of 1.6). The number of counseling sessions also showed a similar dose-response relationship, with a trend toward increasing smoking cessation rates with increasing number of individual treatment sessions up to seven sessions. The preliminary results from the update show an odds ratio of 1.4 (95% C.I.=1.1 to 1.7) for two to three sessions, an odds ratio of 1.9 (95% C.I.=1.6 to 2.2) for four to eight sessions, and an odds ratio of 2.3 (95% C.I.=2.1 to 3.0) for more than eight sessions.

In conclusion, all forms of counseling have statistically significant effects on smoking cessation, with individual counseling appearing to be the most effective method. Dose-response curves are available for length of time spent on each counseling session, number of sessions, and total duration of counseling intervention.

QUESTION 8. HOW EFFECTIVE IS PHARMACOTHERAPY?

In a recent meta-analysis of 91 trials,[24] NRT was found to be more effective than control in smoking cessation, with a pooled odds ratio of 1.72 (95% C.I.=1.60 to 1.84). Different forms of NRT showed moderately different results, as displayed in Table 6. Since the confidence intervals around these estimates of effect overlapped, there was no evidence of a significant difference in the effectiveness of the five types of NRT. The 2000 Public Health Service clinical practice guideline notes a very similar trend in odds ratios.[18]

Table 6. Effectiveness of Nicotine Replacement Therapy versus Control

Delivery Mechanism	Pooled Odds ratio
Gum (49 studies)	1.63
Sublingual tablet (2 studies)	1.73
Patch (32 studies)	1.77
Inhaled nicotine (4 studies)	2.08
Nasal spray (4 studies)	2.27

Buproprion, an antidepressant sold as Wellbutrin, is currently marketed toward smokers under the name Zyban and is currently the only FDA approved drug for smoking cessation other than NRT. A recent quantitative systematic review[25] reported a pooled odds ratio of 2.73 (95% C.I.=1.90 to 3.94) for four studies that compared results for buproprion users with those for a control group. The same review also reported that two studies of nortriptyline (a tricyclic antidepressant) had a pooled odds ratio of 2.83 (95% C.I.=1.59 to 1.03).

Three quantitative systematic reviews on clonidine[17, 26, 27] (which included six studies, seven studies, and 10 studies, respectively) reported pooled odds ratios of 1.89 (95% C.I.=1.30 to 2.74)

and 3.0 (95% C.I.=1.5 to 5.9), respectively, for the first two studies, and a quit rate of 5.7% (95% C.I. = –1.3% to 12.7%) in the third study for clonidine compared with control. There was, however, a high incidence of dose-dependent side effects, particularly sedation and dry mouth. Clonidine is used to treat hypertension and has not been approved by the FDA for smoking cessation.

Two quantitative systematic reviews[17, 25] found no effectiveness for anxiolytics such as buspirone, diazepam, or meprobamate.

QUESTION 9. HOW EFFECTIVE IS SELF-HELP?

Two systematic reviews have reported results on self-help interventions.[17, 22] In the first,[22] a meta-analysis of 25 studies reported a pooled odds ratio of 1.23 (95% C.I.=1.01 to 1.51) compared with control. In the second,[17] a meta-analysis of twelve studies, the pooled odds ratio was 1.2 (95% C.I. 0.97 to 1.6) compared with control. Similar preliminary results were noted in the Public Health Service clinical practice guideline.[18] These data indicate that self-help materials have a small practical effect on smoking cessation.

Studies of helpline/hotline forms of self-help, used alone, had an odds ratio of 1.4 (95% C.I.=1.1 to 1.8). There is no evidence that adding self-help materials to individual counseling or nicotine replacement therapy improved smoking cessation rates.[22]

QUESTION 10. WHAT PRACTICE SETTINGS ARE MORE EFFECTIVE?

Interventions for patients hospitalized with smoking-related illness

In their 1996 guidelines, the AHCPR recommended that all smokers be assisted with quitting during any hospitalization, using any treatment identified as effective by AHCPR. This was also

recommended by the new Public Health Service clinical practice guideline.[18] Hospitalization gives patients a unique opportunity to quit smoking, as all U.S. hospitals are smoke-free. In addition, the hospitalization may have been caused by a smoking-related illness, thus increasing awareness of the dangers of smoking. We considered conducting a meta-regression on hospital interventions versus usual care in hospitals, but this was not possible for several reasons. First, many studies did not use a pure control group. For example, some studies of NRT for hospitalized patients gave the placebo group counseling, self-help literature, etc. In many cases, the difference between NRT and placebo was insignificant if both groups were provided with counseling and follow-up. Second, the populations studied differed in their reasons for hospitalization. For example, some studies included only cardiac patients. while others excluded cardiac patients. Most important, the interventions used were very heterogeneous. Table 7 describes these interventions.

The highest quit rates were found in two studies of cardiac patients.[28, 29] The high rates may have occurred because the immediacy of the situation was apparent to the patients. However, the reported rates may be biased upward, and there was no biochemical confirmation of smoking cessation. In studies where cotinine or carbon monoxide was used to verify self-reports (most other studies), cessation rates were far below those reported in the two studies that relied solely on self-reports. In general, interventions with follow-up calls or visits were shown to be more successful than those without, except in the Rigotti study (1997).

Table 7. Interventions with Hospitalized Patients

First Author	Year	Population	N	Intervention	Quit Rate	Months	Verified
Burt	1974	Male heart attack survivors	125	Dogmatic advice to quit, pamphlet, follow-up by community nurse	62.0%	12	No
			85	Conventional advice to quit	27.5%	12	No
Campbell	1991	Patients with smoking-related respiratory or cardiovascular disease	106	Advice to quit, follow-up by counselor at 2,3,5,13, and 26 weeks, placebo gum	20.0%	12	Yes
			106	Advice to quit, follow-up by counselor at 2,3,5,13 and 26 weeks, nicotine gum	20.0%	12	Yes
Stevens	1993	All smokers hospitalized over 36 hours, expect post-partum or substance abusers	453	20 minute counseling session, 12 minute video, self-help materials, one or two follow-up calls	13.5%	12	No
			666	Usual care	9.2%	12	No
Campbell	1996	Patients with smoking-related respiratory or cardiovascular disease	119	Advice to quit, follow-up by counselor at 2,4,8, and 12 weeks, placebo patch	14.0%	12	Yes
			115	Advice to quit, follow-up by counselor at 2,4,8, and 12 weeks, nicotine patch	21.0%	12	Yes
Taylor	1996	Smokers hospitalized over 36 hours	315	Meeting with nurse case manager, use of videotape, workbook, relaxation tape, NRT, and follow-up calls	31.0%	12	Yes
			313	Usual care	21.0%	12	Yes
Simon	1997	Smokers who underwent non-cardiac surgery	168	Counseling, videotape, self-help literature, NRT, 3 months phone follow-up	15.0%	12	Yes
			156	10 minute brief counseling, self-help literature	8.0%	12	Yes
Rigotti	1997	Smokers hospitalized over 48 hours, excluding intensive care, cognitively impaired	325	15 minute bedside counseling, self help literature, up to 3 weekly phone calls	8.1%	6	Yes
			325	Usual care	8.7%	6	Yes
Rosal	1998	Coronary patients	82	30 minute counseling session, one outpatient counseling visit, follow-up calls	49.0%	60	No
			78	10 minute advice to quit	40.0%	60	No
Lewis	1998	Smokers admitted > 24 hours, excluding drug or alcohol abusers, psychiatric patients, pregnant women, terminal illness, intensive care, major cardiac condition	61	Brief physician motivational message, pamphlet	4.9%	6	Yes
			62	Counseling, nicotine patch, telephone counseling	9.7%	6	Yes
			62	Counseling, placebo patch, telephone counseling	6.5%	6	Yes

Free-standing smoking cessation programs

There are very few inpatient or residential programs designed specifically for smoking cessation. However, in Minnesota, both Hazelden and the Mayo Clinic have such programs. Between 1990 and 1997, almost 400 people were admitted to Hazelden's five-day residential smoking cessation program which uses a 12-step philosophy, cognitive behavioral therapy, stress management, massage, and acupuncture. About two-thirds of the clients were recovering from drug or alcohol addiction (Hazelden's primary focus). The facility reports that about 35% of clients were smoke-free at one-year follow-up.[40]

In 1988, the Mayo Clinic tested the feasibility of a 14-day inpatient program designed to treat nicotine dependence. Modeled after similar programs for drug users, the program combined behavioral, chemical-dependence, and transdermal NRT in a smoke-free environment. The subjects underwent follow-up for 10 weeks after departure and were contacted periodically thereafter. At one year, 29% of the 24 subjects were smoke-free.[41]

The Nicotine Dependence Center at the Mayo Clinic also provides a range of outpatient treatments. An evening group program consists of a series of six sessions, each of which includes an hour of group therapy and a one-hour lecture on specific related topics.[42] The relapse-prevention program consists of follow-up phone calls at one, three, and six months after initial consultation, eight mailed letters, and a one-year follow-up survey. Clients from 1988, the first year of the program, had a one-year quit rate of 20.3%.[43]

The American Cancer Society (ACS) and the American Lung Association (ALA) also conduct smoking cessation clinics. Lando[44] compared a program he designed with their programs in a randomized trial that took place in three Iowa locations. The ACS program consisted of an

orientation session plus four one-hour group sessions over a two-week period. Instructions to clinic leaders placed relatively more weight on individual situations than on group processes. There was no set target date for abstinence. The ALA clinic format consisted of an orientation session and seven additional 90- to 120-minute sessions over a seven-week period. Quit Day occurred at the third session, and the remaining sessions were focused upon maintenance and a healthy lifestyle. Lando's treatment consisted of 16 sessions (45 to 60 minutes each) over a nine-week period. The first three weeks were devoted to preparation for quitting, and the final six, to maintenance. The preparation technique involved switching brands on a 30-60-90 percent weekly reduction schedule. Lando also used an aversive smoke-holding procedure.[45]

Although differences in one-year point prevalence were not significant, there were significant differences in one-year sustained abstinence. Sustained abstinence for the ACS program was 12.08%, compared with 19.01% for the ALA program and 22.19% for the Lando program ($p<0.014$). In addition, significantly fewer clients from the ACS program made a quit attempt ($p<0.004$).

In sum, the few published articles on residential/inpatient smoking cessation programs did not meet our standards for rigor. Importantly, neither study included a control group. In addition, the Hazelden report did not confirm abstinence through biochemical means. Thus, we can not make a statement about the effectiveness of such programs. The only study we found of outpatient smoking cessation clinics was a randomized trial. Although this study did not have a pure control group, it does support recent meta-analysis results indicating that more intensive programs lead to increased success.

QUESTION 11. WHO IS MORE EFFECTIVE IN DELIVERING SMOKING CESSATION INTERVENTIONS?

We identified one systematic review that assessed nursing interventions specifically, and two meta-analyses that assessed the relative effectiveness of different providers. We also conducted our own meta-regression analysis focussing on the relative effectiveness of different providers.

In a systematic review of 14 studies specifically focusing on nursing interventions,[32] smoking cessation rates improved over usual care (odds ratio=1.43, 95% C.I.=1.24 to 1.66). Interventions included cessation advice, counseling, and psychological feedback.

A systematic review of 41 studies comparing nonmedical healthcare providers (social workers, counselors, psychologists), nonphysician medical care providers (pharmacists, nurses, dentists) and physician providers found no statistically significant differences in smoking cessation rates among patients who saw these various providers. The pooled odds ratio was 1.8% (95% C.I.=1.5 to 2.2) for nonmedical providers, 1.4 (95% C.I.=1.1 to 1.8) for nonphysician medical providers, and 1.5 (95% C.I.=1.2 to 1.9) for physicians.[17] However, interventions using multiple providers were found to be more effective than interventions using a single provider (pooled odds ratio=2.8, 95% C.I.=2.6 to 5.6).

In the recent Public Health Service clinical practice guideline the difference between physicians and non-physician clinicians approached statistical significance. The odds-ratios are presented in the table below.

Table 8. Efficacy of Interventions Delivered by Various Types of Clinicians

Type of Clinician	Estimated Odds Ratio	95% C.I.	Estimated Abstinence Rate	95% C.I.
No clinician	1.0		10.2	
Self-Help	1.1	0.9-1.3	10.9	9.1-12.7
Nonphysician clinician	1.7	1.3-2.1	15.8	12.8-18.8
Physician clinician	2.2	1.5-3.2	19.9	13.7-26.2

We conducted a meta-regression containing 56 arms comparing an intervention with a control group. The results are given in Table 9.

Table 9. Meta-regression Results by Provider

Provider	Adjusted Odds Ratio	95% C.I.
Physician	3.02	2.62-3.48
Psychiatrist/psychologist	2.68	1.79-4.00
Nurse	2.38	1.87-3.03
Counselor	1.87	1.35-2.61
Unknown	1.41	1.09-1.83
Other (self-help, etc)	1.37	1.15-1.65

The trend indicates that physicians are the most effective intervention providers, compared with control, followed by psychiatrists/psychologists, then nurses. Physicians had a statistically significant advantage over lay counselors, self-help, and interventions where provider was unknown. Interventions using psychiatrists/psychologists and nurses were shown to be significantly more effective than self-help or interventions with unknown provider type.

In summary, the data support that many types of providers are effective. In two of three comparative meta-analyses, physician providers compared to non-physician providers had a higher estimated odds ratio of effectiveness, and in one synthesis this difference was statistically significant.

QUESTION 12. DO CERTAIN INTERVENTIONS WORK BETTER FOR SPECIAL POPULATIONS?

Hispanics / Latinos

We found a single controlled trial of smoking cessation interventions designed specifically for Latinos. In Queens, New York, Nevid and Javier[46] compared a culturally specific multicomponent intervention with a low-intensity, enhanced self-help control. The intervention group (N=78) met weekly to watch videos containing culturally specific smoking-related vignettes. Members of each group were of the same gender. The sessions followed a staging model in which exposure to motivation enhancement exercises was followed by relapse-prevention training in later sessions. The control group (N=75) attended an introductory session and received supportive follow-up telephone calls. Both intervention and control groups were given the ALA smoking cessation manual, *Freedom from Smoking in 20 Days* (in both English and Spanish), as well as a Spanish-language help booklet, *Guia para Dejar de Fumar*.

Unfortunately, only two participants (one in the control group, one in the intervention) demonstrated cotinine-validated abstinence at both post-treatment and 12-month follow-up. Thus, the benefits of this particular culturally specific, multicomponent intervention for Latinos/Latinas are questionable and certainly do not persist over time.

African Americans

Although the vast majority of smoking studies consist primarily of Caucasian subjects, several studies have evaluated smoking cessation interventions designed specifically for African Americans. The most recent studies are described below.

Ahluwalia and colleagues[47] conducted a double-blind, randomized controlled trial at a hospital outpatient program for inner-city African Americans. The multifaceted intervention included brief counseling, a culturally appropriate cessation guide written at sixth-grade level, and either a nicotine patch or a placebo patch. In addition, patients were reimbursed for transportation costs. The six-month self-reported quit rate was 17.1% for the nicotine patch group and 11.7% for the placebo patch group ($p < .08$).

Fisher[48] studied a community intervention in low-income African American neighborhoods in St. Louis. The intervention included smoking cessation classes, billboards, a gospel fest, and door-to-door distribution of self-help materials. Over two years, smoking prevalence decreased from 34% to 27% in program neighborhoods, and from 34% to 33% in control neighborhoods in Kansas City.

Schorling and colleagues[49] studied a church-based intervention in rural Virginia which combined one-on-one counseling with self-help materials and communitywide activities. The intervention was implemented throughout one county, while a similar county served as a control. There was a significant change in subjects' stages of change in the intervention county compared with the stages of change in the control county. Although the smoking cessation rate was higher in the intervention county, the difference was not statistically significant.

In the 1980's, the Harlem Health Connection developed and tested a culturally sensitive self-help smoking cessation program[50] based on Prochaska's stages of change.[51] Members of the intervention group received a culturally sensitive cessation guide written at fifth-grade level, a cessation video featuring African American historical figures, and a telephone booster call. The control group received health education materials not directly addressing smoking. There was no significant difference in quit rates between the intervention group and the control group at six-month follow-up.

Goldberg[52] designed an intervention based on the stages of change which involved training medical residents to provide brief counseling to patients. The intervention took place in the outpatient section of Chicago's Cook County Hospital, where over 90% of the patients are African American. The trained residents saw patients in the intervention group, while residents who did not undergo the training saw the control group. Although the intervention group moved ahead in stages of change, the difference in quit rates between the groups was not statistically significant.

In summary, one of the five studies targeted toward African American populations showed statistically significant improvements in smoking cessation compared to control. No studies have been reported that demonstrate reduced or enhanced effectiveness of generic smoking cessation interventions among different ethnic/racial groups. Thus, we encourage studies on generic interventions to publish results stratified by these groups. In addition, more research on the effectiveness of targeted versus generic interventions is needed.

QUESTION 13 & 14. WHAT ARE THE COSTS AND COST EFFECTIVENESS OF INTERVENTIONS?

This section will discuss the cost and cost-effectiveness of different interventions studied in this review, including counseling, self-help and mass media. It is important to note that medications are sometimes combined with these interventions. Few articles except for those specifically on cost-effectiveness detail costs. Table 10 lists the average wholesale cost per dose and cost per day for these medications.[33]

Table 10. Costs of Smoking Cessation Medications (average wholesale price)

Medication	Cost per dose	Cost per day
Nicotine patch	$3 each	$3
Nicotine inhaler	$1/ 10mg	$1.50
OTC Nicotine gum	$0.50/ piece	$5
Bupropion	$1.40/ 150 mg pill	$2.80
Clonidine*	$0.25/ 0.2mg pill	$0.50

* not FDA approved for smoking cessation

Which interventions are most cost-effective?

The available evidence suggests that smoking cessation interventions are highly cost-effective when compared with other medical treatments and prevention programs.[18, 34] The widely held view of smoking cessation as the "gold standard" of healthcare cost-effectiveness is underscored by the fact that even the least cost-effective smoking intervention — the use of nicotine gum as an adjunct to physician counseling — is estimated to cost less than half the median cost per life-year saved of nearly 600 life-saving interventions.[35]

We reviewed 15 published studies examining the cost-effectiveness (C/E) of various smoking cessation programs and three review articles. Eight of the cost-effectiveness analyses (CEA)

were medical practice-based and seven were community-based interventions. In general, community-based programs tended to be less cost-effective than practice-based interventions. Further, practice-based interventions generally applied more rigorous methodologies such as randomized clinical trials. All of the studies discussed below and outlined in Table 11 examined adult smokers, yet none solely targeted the elderly.

Table 11. Summary of Cost-effectiveness of Smoking Cessation Interventions in 1999 dollars

Interventions	Cost effectiveness*	Characteristics	Reference
		Medical practice-based interventions	
Counseling only	$317	Brief advice in U.K. (3 minutes)	Parrott, 1998[53]
Counseling and self-help material	$403	Brief advice in U.K. (4 minutes)	Parrot, 1998[53]
	$5,928	Minimal individual (3 minutes)	Cromwell, 1997[27]
	$4,696	Brief individual (7 minutes)	" "
	$2,237	Full individual (15 minutes)	" "
	$2,690	Intensive individual	" "
	$1,635	Intensive group	" "
Counseling, self-help material and NRT	$490 (patch)	Brief advice in U.K. (7 minutes)	Parrott, 1998[53]
	$3,551 (patch)	Minimal individual (6 minutes)	Cromwell, 1997[27]
	$6,707 (gum)	Minimal individual (6 minutes)	" "
Adding NRT to physician counseling	$686 ~ $1,354 (patch)	Under Age 35 up to 65 years in U.K.	Stapleton, 1999[54]
	$1,963 ~ $2,603 (patch)	Men age 35-64	Wasley, 1997[55]
	$3,224 (patch)	Men age 65-69	" "
	$3,323 ~ $4,000	Women age 35-64	" "
	$5,069 (patch)	Women age 65-69	" "
	$4,799 ~ $8,808 / QALYS (patch)	Men age 25-64	Fiscella, 1996[56]
	$11,963 / QALYS (patch)	Men age 65-69	" "
	$5,417 ~ $6,851 / QALYS (patch)	Women age 25-64	" "
	$7,634 / QALYS (patch)	Women age 65-69	" "
	$6,368 ~ $8,085 (gum)	Men age 35-64	Oster, 1986[57]
	$10,010 (gum)	Men age 65-69	" "
	$10,652 ~ $13,929 (gum)	Women age 35-64	" "
	$14,400 (gum)	Women age 65-69	" "
Hospital programs	$254	Nurse-managed program for acute MI patients	Krumholz, 1993[58]
	$1,901 - $8,368	Hospital-based (counseling, video, self-help, follow-up phone calls)	Meenan, 1998[59]
Specialist clinics	$ 465	Specialist service in addition to physician counseling and NRT (U.K.)	Parrott, 1998[53]
	$7,872	Mayo Clinic with a variety of intervention approaches	Croghan, 1997[42]

Table 11. Summary of Cost-effectiveness of Smoking Cessation Interventions in 1999 dollars (continued)

Interventions	Cost effectiveness*	Characteristics	Reference
	Community-based interventions		
Self-help / quit contests	$264/quitter	1 yr	Altman, 1987[60]
	$909-$2,113/quitter	1 yr (1979 dollars)	Davis, 1984[61]
Mass media	$596 - $1,286	Television spots and phone helpline (U.K.)	Ratcliffe, 1997[62]
	$1,538-$1,721	(Sweden)	" "
	$55/quitter	At 1 yr (television spots were free)	Danaher, 1984[63]
Workplace programs	$2.05/$1 cost-benefit ratio	18 months - Health promotion program.	Bertera, 1990[64]
State initiatives	CA: decline of 3.9 packs/capita/yr	Effect of 8 advertising strategies to prevent smoking in CA and MA.	Goldman, 1998[65]
	MA: decline of 0.5 packs/capita/yr		" "

* Cost-effectiveness expressed as cost per life year saved in 1999 dollars in both the table and the text, unless otherwise noted.

Medical Practice-Based Interventions

Before the advent of NRT in the 1980s, smoking cessation programs largely consisted of self-help guides and physician exhortations to quit.[18, 34] Yet once NRT was widely shown to increase cessation rates, it became a critical component of most smoking interventions. Recent studies by Cromwell et al.[27] and Parrott et al.[53] examined the cost-effectiveness of adding self-help and nicotine replacement therapy to physician counseling. Cromwell and colleagues analyzed 15 interventions based on clinical practice guidelines outlined by AHRQ (formerly AHCPR).[17] The interventions included five counseling options (minimal, brief, full, individual intensive, and group intensive), either alone or in conjunction with two types of nicotine replacement therapy (transdermal nicotine patch or nicotine gum). Outcome measures included cost per quitter, cost per life-year saved, and cost per quality-adjusted life-year (QALY), and C/E ratios were computed relative to use of self-help materials only. Cromwell et al. estimated that the cost per

life year saved ranged from $1,635 to $6,707 across the various interventions. Furthermore, more intensive counseling and counseling combined with a nicotine patch were more cost-effective than other counseling options or counseling with nicotine gum.

Parrott et al.[53] examined similar interventions, yet reached somewhat different conclusions. Parrott and colleagues estimated the cost per life year saved due to the interventions was less than $500. In addition, counseling in conjunction with a nicotine patch cost more per life-year saved than counseling alone or counseling with self-help materials. This finding is consistent with Warner's observation that costs increase faster than effectiveness. It is difficult to compare findings across studies because they rely on different methodologies, patient populations, and health care environments (U.K. vs U.S.). For example, the studies by Parrott and Cromwell assumed widely different relapse rates, counseling time, and required physician wage rates. Further, they evaluated the effectiveness of the interventions against somewhat different controls.

Four additional studies estimated the cost-effectiveness of adding pharmacotherapy to provider counseling. Three of the studies estimated the marginal impact of nicotine patches,[54-56] while Oster et al.[57] examined nicotine gum as an adjunct to counseling. Oster et al. found that nicotine gum in combination with physician counseling cost $6400 to $14400 per life year saved above physician counseling only, depending on the participants age and gender. This compares favorably with other medical interventions, but based on current estimates, is less cost-effective than nicotine patches and counseling. The three "patch" studies yielded C/E ratios ranging from roughly $700 to $7000 per life year saved. Stapleton et al.[54] found more favorable C/E due to lower medical costs in the U.K. than the U.S. and greater patient cost-sharing of NRT. Fiscella and Franks[56] reported the least favorable effect of nicotine patches, largely because they assumed

higher use of pharmacotherapy per smoker and lower effectiveness rates compared to Wasley et al.[55] All four studies of NRT provided age-specific C/E ratios, and three of the four found that cost-effectiveness declined modestly with age.

Other practice-based smoking cessation interventions included hospital-based programs and specialist clinics. Because these programs were often operated by nonphysician clinicians (e.g., nurses, counselors), costs per-minute of counseling were substantially lower than physician-based approaches. Moreover, they typically involved more intensive treatment and thus achieved higher quit rates, especially among smokers who had failed in less-intensive treatments. The principal limitation of these types of specialized programs is that they fail to reach the vast majority of smokers.

Community-Based Interventions

Several researchers have examined the effectiveness of advertising and mass media campaigns that encourage smokers to quit or discourage youth from starting to smoke.[62, 63, 65] Community-based interventions typically reach a far broader audience of smokers and nonsmokers than practice-based programs. For example, a brief mass-media campaign in Scotland resulted in over 82,000 calls to a telephone quitline, and was modestly successful in increasing quit rates.[62] Another community-based study by Altman et al.[60] compared the effectiveness of a smoking cessation class, an incentive-based quit contest, and a self-help smoking kit. They found the smoking cessation class was the most effective in reducing smoking prevalence, while the self-help kit was the most cost-effective.

A recent meta-analysis of anti-smoking advertisements indicates that the content and delivery of mass media campaigns have direct impact on participation rates and effectiveness. Goldman et

al.[65] found that more aggressive anti-smoking campaigns are more effective in reducing tobacco consumption. Further, ads that emphasize industry manipulation and secondhand smoke were believed to be the most effective in a review of evidence from 186 focus groups.

Studies of smoking cessation in the workplace are often part of larger programs concerned with health promotion and prevention. These studies differ from most smoking cessation programs in that the principal outcome measure is workloss or disability days rather than quit rates or costs per quitter. Bertera[64] evaluated a large, multi-site health promotion program using a pre- and post-control group design. Disability days declined more than 8 percentage points over two years for hourly employees who participated in health promotion classes and self-help programs -- including smoking cessation -- compared to the control groups. While findings from workplace-based programs appear to be highly effective, it is difficult to assess the impact of specific smoking interventions when they are part of broader health promotion programs.

All of the studies reviewed saved life-years at a cost as low as several hundred dollars to a high of $14,000, with a median value of about $5,000 per life year saved. These findings are well below the estimates of most other health interventions. The principal shortcoming of this literature is a lack of evidence on the effectiveness of smoking cessation programs for specific patient subgroups -- such as the elderly -- and their preferences for specific interventions. As Warner[34] noted, different interventions are effective for different people. A resource-intensive treatment may be cost effective for smokers who do not respond to less-intensive programs, but may not be successful for smokers attempting to quit for the first time. Further investigation is needed to determine the cost-effectiveness of various smoking cessation interventions on specific patient populations.

LIMITATIONS OF THIS REVIEW

The primary limitation of this systematic review—a limitation that is common to all such reviews—is the quantity and quality of the original studies. Even more so than in reviews of single therapies (e.g., coronary revascularization for coronary artery disease, pharmaceutical therapy for rheumatoid arthritis), the studies presented here are extremely heterogeneous in terms of both the interventions tested and the specific populations or health care systems studied. Furthermore, many of the study-level variables are highly idiosyncratic and intercorrelated (e.g., a study of patient education with nurses may also be a study of NRT among low-income African Americans). This correlation between intervention-level variables and population makes the assessment of the effect of the individual components challenging.

We gave equal importance to all studies that met our minimum criteria. We made no attempt to give greater importance to those that had better design and characteristics that have been postulated to produce more valid results, because for these types of studies, there is a lack of empirical evidence of the relationship between study characteristics and bias.

In addition, several studies randomized by provider or clinic. Because the majority of these studies did not correct for the potential clustering of patients within one of these larger units, they tended to underestimate the variance in the estimate of the effect of the intervention.

Finally, this study assumes that interventions will achieve equal success when targeted toward adults 65 years of age or older. We were not able to empirically test this assumption because we had insufficient data.

CONCLUSIONS

1. Individual, telephone, and group counseling are all effective, with individual counseling being possibly most effective.

2. There is consistent evidence from multiple analyses that greater intensity of counseling yields higher smoking cessation rates.

3. Nicotine replacement therapy (NRT), clonidine, and bupropion are all effective as pharmacotherapy for smoking cessation, although clonidine is not approved by the FDA for this use.

4. Patients visiting physicians trained in smoking cessation had higher cessation rates than those visiting untrained physicians.

5. Health insurance benefits of 100% for both counseling and NRT produced the greatest number of quitters in a population.

6. There is good evidence that both medical and non-medical providers are effective at delivering smoking cessation services, but conflicting evidence about the relative degree of effectiveness between provider types.

7. Interventions with follow-up calls or visits are more effective than those without.

8. There are insufficient data to support or refute variations on smoking cessation interventions among special populations.

RECOMMENDATIONS

Recommendations based on the evidence were formulated by a panel of experts on smoking cessation, health services research, medicine, and behavior change.

1. Smoking cessation interventions should be tested as a Medicare benefit.

2. Any demonstration project should include pharmacotherapy, physician visit, and/or telephone hotline. Group counseling should not be required, as most older smokers will avoid groups.

3. Primary care practitioners participating in smoking cessation demonstrations should be offered and encouraged to have training in this area.

4. There is no evidence that paying providers for outcomes will work, and there is considerable evidence that it will not. However, providers should be held accountable for their performance in accordance with the AHRQ guidelines. The five As (ask, advise, assess, assist, and arrange) should be documented in provider records.

5. As in any demonstration project, sufficient numbers of minorities and women should be included.

IN TEXT REFERENCES

1. Kaplan GA, Seeman TE, Cohen RD, Knudsen LP, Guralnik J. Mortality among the elderly in the Alemeda County Study. *Am J Public Health.* 1987;77:307-12.
2. Clark MA, Rakowski W, Kviz FJ, Hogan JW. Age and stage of readiness for smoking cessation. *J Gerontol B Psychol Sci Soc Sci*. 1997;52(4):S212-21.
3. Centers for Disease Control and Prevention. *Best Practices for Comprehensive Tobacco Control Programs - August 1999.* Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 1999.
4. McGinnis JM, Foege WH. Actual causes of death in the United States [see comments]. *JAMA.* 1993;270(18):2207-12.
5. Centers for Disease Control and Prevention. Cigarette smoking among adults--United States, 1995. *MMWR Morb Mortal Wkly Rep.* 1997;46:1217-1220.
6. Centers for Disease Control and Prevention. Physician and other health-care professional counseling of smokers to quit--United States, 1991. *MMWR Morb Mortal Wkly Rep.* 1993;42(44):854-7.
7. Zhang X, Miller L, Max W, Rice DP. Cost of smoking to the Medicare program, 1993. *Health Care Financing Review*. 1999;20(4):179-196.
8. Califano JA. The impact of substance abuse. *Tobacco Control*. 1995;4(suppl 2):S19-24.
9. Morgan GD, Noll EL, Orleans CT, et al. Reaching midlife and older smokers: Tailored interventions for routine medical care. *Prev Med.* 1996;25(3):346-54.

10. Lacroix AZ. Thiazide diuretic agents and prevention of hip fracture [published erratum appears in Compr Ther 1992 Feb;18(2):42]. *Compr Ther.* 1991;17(8):30-9.

11. Hermanson B, Omenn GS, Kronmal RA, et al. Beneficial six-year outcome of smoking cessation in older men and women with coronary artery disease. Results from the CASS registry [see comments]. *N Engl J Med.* 1988;319(21):1365-1369.

12. Tell GS, Howard G, McKinney WM, Toole JF. Cigarette smoking cessation and extracranial carotid atherosclerosis. *JAMA.* 1989;261:1178-80.

13. Sachs DPL. Cigarette smoking: Health effects and cessation strategies. *Clin Geriatr Med*. 1986;2:337-362.

14. Rimer BK, Orleans T, Keints MK, Cristinzio S, Fleisher L. The older smoker. Status, challenges and opportunities for intervention. *Chest.* 1990;97(3):547-53.

15. Cox DJ, Gonder-Frederick L, Julian DM, Clarke W. Long-term follow-up evaluation of blood glucose awareness training. *Diabetes Care*. 1997;17:1-5.

16. Fiore MC, Novotny TE, Pierce JP, et al. Methods used to quit smoking in the United States. Do cessation programs help? [published erratum appears in JAMA 1991 Jan 16;265(3):358]. *JAMA.* 1990;263(20):2760-5.

17. Fiore MC, Baily WC, Cohen SJ, and et al. *Smoking Cessation.* Clinical Practice Guideline No. 18. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research. AHCPR Publication No.96-0692. April 1996.

18. Fiore M, Baily WC, Cohen SJ, and et al. *Treating Tobacco Use and Dependence: A Clinical Practice Guideline.* Rockville, MD: U.S. Department of Health and Human Services, Public Health Service. June 2000.

19. Lancaster T, Silagy C, Fowler G, et al. Training health professionals in smoking cessation (Cochrane Review). In: *The Cochrane Library*. Issue 3, 1999a. Oxford: Update Software.

20. Curry SJ, Grothaus LC, McAfee T, et al. Use and cost effectiveness of smoking-cessation services under four insurance plans in a health maintenance organization. *N Engl J Med.* 1998;339(10):673-9.

21. Silagy C, Ketteridge S. Physician advice for smoking cessation (Cochrane Review). In: *The Cochrane Library*. Issue 3, 1999. Oxford: Update Software.

22. Lancaster T, Stead F. Self-help interventions for smoking cessation (Cochrane Review). In: *The Cochrane Library*. Issue 3, 1999b. Oxford: Update Software.

23. Stead L, Lancaster T. Group behavior therapy programs for smoking cessation (Cochrane Review). In: *The Cochrane Library*. Issue 3, 1999. Oxford: Update Software.

24. Silagy C, Mant D, Fowler G, et al. Nicotine replacement therapy for smoking cessation (Cochrane Review). In: *The Cochrane Library*. Issue 3, 1999b. Oxford: Update Software.

25. Hughes J, Stead L, and Lancaster T. Anxiolytics and antidepressants for smoking cessation (Cochrane Review). In: *The Cochrane Library*. Issue 3, 1999. Oxford: Update Software.

26. Gourlay S, Stead L, and Benowitz N. Clonidine for smoking cessation (Cochrane Review). In: *The Cochrane Library*. Issue 3, 1999. Oxford: Update Software.

27. Cromwell J, Bartosch WJ, Fiore MC, et al. Cost-effectiveness of the clinical practice recommendations in the AHCPR guideline for smoking cessation. Agency for Health Care Policy and Research [see comments]. *JAMA.* 1997;278(21):1759-1766.

28. Burt A, Thornley P, Illingworth D, et al. Stopping smoking after myocardial infarction. *Lancet.* 1974;1(7852):304-6.

29. Rosal MC, Ockene JK, Ma Y, et al. Coronary Artery Smoking Intervention Study (CASIS): 5-year follow-up. *Health Psychol.* 1998;17(5):476-8.

30. Rigotti NA, Arnsten JH, McKool KM, et al. Efficacy of a smoking cessation program for hospital patients. *Arch Intern Med.* 1997;157(22):2653-60.

31. Silagy C, Mant D, Fowler G, et al. Meta-analysis on efficacy of nicotine replacement therapies in smoking cessation. *Lancet.* 1994;343(8890):139-42.

32. Rice V, Stead L. Nursing interventions for smoking cessation (Cochrane Review). In: *The Cochrane Library*. Issue 3, 1999. Oxford: Update Software.

33. *Drug Topics Red Book.* Montvale, NJ: Medical Economics Company Inc., 1999.

34. Warner KE. Cost effectiveness of smoking-cessation therapies. *Pharmacoeconomics.* 1997;11(6):538-549.

35. Tengs TO, Adams ME, Pliskin JS, et al. Five-hundred life-saving interventions and their cost-effectiveness. *Risk Analysis*. 1995;15(3):369-389.

36. Woolf SH. *AHCPR interim manual for clinical practice guideline development.* AHCPR publication No. 91-0018. Rockville, MD: Department of Health and Human Services. 1991.

37. Moher D, Pham D, Jones A, et al. Does quality of reports of randomized trials affect estimates of interventions efficacy reported in meta-analyses? *Lancet.* 1998;352:609-613.

38. SAS Institute Inc. *SAS/STAT User's Guide, Version 6*. Cary, NC: SAS Institute, Inc., 1989.

39. Stuck AE, Siu AL, Wieland GD, et al. Comprehensive geriatric assessment: a meta-analysis of controlled trials. *Lancet.* 1993;342:1032-6.

40. Owen P, Duncan L. One-year outcomes of a residential smoking cessation program. *Journal of Addictive Diseases.* 1997;16(4):135.

41. Hurt RD, Dale LC, Offord KP, et al. Inpatient treatment of severe nicotine dependence. *Mayo Clin Proc.* 1992;67(9):823-8.

42. Croghan IT, Offord KP, Evans RW, et al. Cost-effectiveness of treating nicotine dependence: the Mayo Clinic experience. *Mayo Clin Proc.* 1997;72(10):917-924.

43. Hurt RD, Lauger GG, Offord KP, et al. An integrated approach to the treatment of nicotine dependence in a medical setting. *Clin Res.* 1991;39(2):636A.

44. Lando HA, McGovern PG, Barrios FX, et al. Comparative evaluation of American Cancer Society and American Lung Association smoking cessation clinics. *Am J Public Health.* 1990;80(5):554-9.

45. Kopel S, Suckerman K, Baksht A. Smoke holding: an evaluation of physiological effects and treatment efficacy of a new nonhazardous aversive smoking procedure. Paper Presented at a Meeting of the Association for Advancement of Behavior Therapy: 1979.

46. Nevid JS, Javier RA. Preliminary investigation of a culturally specific smoking cessation intervention for Hispanic smokers. *Am J Health Promot.* 1997;11(3):198-207.

47. Ahluwalia JS, McNagny SE, Clark WS. Smoking cessation among inner-city African Americans using the nicotine transdermal patch. *J Gen Intern Med.* 1998;13(1):1-8.

48. Fisher EB, Auslander WF, Munro JF, et al. Neighbors for a smoke free north side: Evaluation of a community organization approach to promoting smoking cessation among African Americans. *Am J Public Health.* 1998;88(11):1658-63.

49. Schorling JB, Roach J, Siegel M, et al. A trial of church-based smoking cessation interventions for rural African Americans. *Prev Med.* 1997;26(1):92-101.

50. Allen CM, Becker PM, McVey LJ, et al. A randomized, controlled clinical trial of a geriatric consultation team. Compliance with recommendations. *JAMA.* 1986;255(19):2617-21.

51. Prochaska JO, DiClemente CC. Stages and processes of self-change of smoking: toward an intergrative model of change. *J Consult Clin Psychol.* 1983;51(3):390-5.

52. Goldberg DN, Hoffman AM, Farinha MF, et al. Physician delivery of smoking-cessation advice based on the stages-of- change model. *Am J Prev Med.* 1994;10(5):267-74.

53. Parrott S, et al. Guidance for commissioners on the cost-effectiveness of smoking cessation interventions. *Thorax.* 1998;53 Suppl 5(2):s1-38.

54. Stapleton JA, Lowin A, Russell MA. Prescription of transdermal nicotine patches for smoking cessation in general practice: evaluation of cost-effectiveness. *Lancet.* 1999;354(9174):210-215.

55. Wasley MA, McNagny SE, Phillips VL, et al. The cost-effectiveness of the nicotine transdermal patch for smoking cessation [see comments]. *Prev Med.* 1997;26(2):264-270.

56. Fiscella K, Franks P. Cost-effectiveness of the transdermal nicotine patch as an adjunct to physicians' smoking cessation counseling [see comments]. *JAMA.* 1996;275(16):1247-1251.

57. Oster G, Huse DM, Delea TE, et al. Cost-effectiveness of nicotine gum as an adjunct to physician's advice against cigarette smoking. *JAMA.* 1986;256(10):1315-8.

58. Krumholz HM, Cohen BJ, Tsevat J, et al. Cost-effectiveness of a smoking cessation program after myocardial infarction [see comments]. *J Am Coll Cardiol.* 1993;22(6):1697-1702.

59. Meenan RT, Stevens VJ, Hornbrook MC, et al. Cost-effectiveness of a hospital-based smoking cessation intervention. *Med Care.* 1998;36(5):670-8.

60. Altman DG, Flora JA, Fortmann SP, et al. The cost-effectiveness of three smoking cessation programs. *Am J Public Health.* 1987;77(2):162-165.

61. Davis AL, Faust R, Ordentlich M. Self-help smoking cessation and maintenance programs: A comparative study with 12-month follow-up by the American Lung Association. *Am J Public Health.* 1984;74(11):1212-7.

62. Ratcliffe J, Cairns J, Platt S. Cost effectiveness of a mass media-led anti-smoking campaign in Scotland. *Tob Control.* 1997;6(2):104-110.

63. Danaher BG, Berkanovic E, Gerber B. Mass media based health behavior change: televised smoking cessation program. *Addict Behav.* 1984;9(3):245-253.

64. Bertera RL, Oehl LK, Telephak JM. Self-help versus group approaches to smoking cessation in the workplace: Eighteen-month follow-up and cost analysis. *Am J Health Promot.* 1990;4:187-92.

65. Goldman LK, Glantz SA. Evaluation of antismoking advertising campaigns [see comments]. *JAMA.* 1998;278(10):772-777.

ARTICLES ACCEPTED FOR THIS REVIEW

Comparison of four methods of smoking withdrawal in patients with smoking related diseases. Report by a subcommittee of the Research Committee of the British Thoracic Society. *BrMed J (Clin Res Ed).* 1983;286:595-7.

Randomised trial of nicotine patches in general practice: Results at one year. Imperial Cancer Research Fund General Practice Research Group. *BMJ.* 1994;308:1476-7.

Smoking cessation in patients: Two further studies by the British Thoracic Society. Research Committee of the British Thoracic Society. *Thorax.* 1990;45:835-40.

Transdermal nicotine for smoking cessation. Six-month results from two multicenter controlled clinical trials. Transdermal Nicotine Study Group. *JAMA.* 1991;266:3133-8.

Abelin T, Ehrsam R, Buhler-Reichert A, et al. Effectiveness of a transdermal nicotine system in smoking cessation studies. *Methods Find Exp Clin Pharmacol.* 1989;11:205-14.

Ahluwalia JS, McNagny SE, Clark WS. Smoking cessation among inner-city African Americans using the nicotine transdermal patch. *J Gen Intern Med.* 1998;13:1-8.

Areechon W, Punnotok J. Smoking cessation through the use of nicotine chewing gum: A double- blind trial in Thailand. *Clin Ther.* 1988;10:183-6.

Blondal T. Controlled trial of nicotine polacrilex gum with supportive measures. *Arch Intern Med.* 1989;149:1818-21.

Blondal T, Franzon M, Westin A. A double-blind randomized trial of nicotine nasal spray as an aid in smoking cessation. *Eur Respir J.* 1997;10:1585-90.

Blondal T, Gudmundsson LJ, Olafsdottir I, Gustavsson G, Westin A. Nicotine nasal spray with nicotine patch for smoking cessation: Randomised trial with six year follow up. *BMJ.* 1999;318:285-8.

Brantmark B, Ohlin P, Westling H. Nicotine-containing chewing gum as an anti-smoking aid. *Psychopharmacologia.* 1973;31:191-200.

Brown S, Hunt G, Owen N. The effect of adding telephone contact to self-instructional smoking-cessation materials. *Behav Change.* 1992;9:216-22.

Burling TA, Marotta J, Gonzalez R, et al. Computerized smoking cessation program for the worksite: Treatment outcome and feasibility. *J Consult Clin Psychol.* 1989;57:619-22.

Burt A, Thornley P, Illingworth D, White P, Shaw TR, Turner R. Stopping smoking after myocardial infarction. *Lancet.* 1974;1:304-6.

Campbell EE, Lyles MF, Strecher VJ, Gonzalez JJ. Teaching smoking cessation counseling skills to resident physicians. *Clin Res.* 1989;37:805A.

Campbell IA, Hansford M, Prescott RJ. Effect of a "stop smoking" booklet on smokers attending for chest radiography: A controlled study. *Thorax.* 1986;41:369-71.

Campbell IA, Lyons E, Prescott RJ. Stopping smoking. Do nicotine chewing-gum and postal encouragement add to doctors' advice? *Practitioner.* 1987;231:114-7.

Campbell IA, Prescott RJ, Tjeder-Burton SM. Smoking cessation in hospital patients given repeated advice plus nicotine or placebo chewing gum. *Respir Med.* 1991;85:155-7.

Campbell IA, Prescott RJ, Tjeder-Burton SM. Transdermal nicotine plus support in patients attending hospital with smoking-related diseases: A placebo-controlled study. *Respir Med.* 1996;90:47-51.

Carlsson R, Lindberg G, Westin L, Israelsson B. Influence of coronary nursing management follow up on lifestyle after acute myocardial infarction. *Heart.* 1997;77:256-9.

Cinciripini PM, Lapitsky L, Seay S, Wallfisch A, Kitchens K, Van Vunakis H. The effects of smoking schedules on cessation outcome: Can we improve on common methods of gradual and abrupt nicotine withdrawal? *J Consult Clin Psychol.* 1995;63:388-99.

Cinciripini PM, Lapitsky L, Seay S, Wallfisch A, Meyer WJ 3rd, van Vunakis H. A placebo-controlled evaluation of the effects of buspirone on smoking cessation: Differences between high- and low-anxiety smokers. *J Clin Psychopharmacol.* 1995;15:182-91.

Cinciripini PM, Lapitsky LG, Wallfisch A, Mace R, Nezami E, Van Vunakis H. An evaluation of a multicomponent treatment program involving scheduled smoking and relapse prevention procedures: Initial findings. *Addict Behav.* 1994;19:13-22.

Clavel F, Benhamou S, Company-Huertas A, Flamant R. Helping people to stop smoking: Randomised comparison of groups being treated with acupuncture and nicotine gum with control group. *Br Med J (Clin Res Ed).* 1985;291:1538-9.

Cohen SJ, Stookey GK, Katz BP, Drook CA, Christen AG. Helping smokers quit: A randomized controlled trial with private practice dentists. *J Am Dent Assoc.* 1989;118:41-5.

Cohen SJ, Stookey GK, Katz BP, Drook CA, Smith DM. Encouraging primary care physicians to help smokers quit. A randomized, controlled trial. *Ann Intern Med.* 1989;110:648-52.

Cottraux JA, Harf R, Boissel JP, Schbath J, Bouvard M, Gillet J. Smoking cessation with behaviour therapy of acupuncture--a controlled study. *Behav Res Ther.* 1983;21:417-24.

Cox JL, McKenna JP. Nicotine gum: Does providing it free in a smoking cessation program alter success rates? *J Fam Pract.* 1990;31:278-80.

Crealey GE, McElnay JC, Maguire TA, O'Neill C. Costs and effects associated with a community pharmacy-based smoking-cessation programme. *Pharmacoeconomics.* 1998;14:323-33.

Croghan GA, Hurt RD, Croghan IT, et al. Comparison of a 15 mg transdermal nicotine patch alone versus nicotine nasal spray alone versus both for smoking cessation. *Journal of Addictive Diseases.* 1998;17:PA1-A1.

Cuckle HS, Van Vunakis H. The effectiveness of a postal smoking cessation ”kit”. *Community Med.* 1984;6:210-5.

Cummings KM, Emont SL, Jaen C, Sciandra R. Format and quitting instructions as factors influencing the impact of a self-administered quit smoking program. *Health Educ Q.* 1988;15:199-216.

Cummings SR, Coates TJ, Richard RJ, et al. Training physicians in counseling about smoking cessation. A randomized trial of the ”Quit for Life“ program. *Ann Intern Med.* 1989;110:640-7.

Cummings SR, Richard RJ, Duncan CL, et al. Training physicians about smoking cessation: A controlled trial in private practice. *J Gen Intern Med.* 1989;4:482-9.

Curry SJ, Marlatt GA, Gordon J, Baer JS. A comparison of alternative theoretical approaches to smoking cessation and relapse. *Health Psychol.* 1988;7:545-56.

Curry SJ, McBride C, Grothaus LC, Louie D, Wagner EH. A randomized trial of self-help materials, personalized feedback, and telephone counseling with nonvolunteer smokers. *J Consult Clin Psychol.* 1995;63:1005-14.

Curry SJ, Wagner EH, Grothaus LC. Evaluation of intrinsic and extrinsic motivation interventions with a self-help smoking cessation program. *J Consult Clin Psychol.* 1991;59:318-24.

Dale LC, Hurt RD, Offord KP, Lawson GM, Croghan IT, Schroeder DR. High-dose nicotine patch therapy. Percentage of replacement and smoking cessation. *JAMA.* 1995;274:1353-8.

Danaher BG, Jeffery RW, Zimmerman R, Nelson E. Aversive smoking using printed instructions and audiotape adjuncts. *Addict Behav.* 1980;5:353-8.

Daughton DM, Heatley SA, Prendergast JJ, et al. Effect of transdermal nicotine delivery as an adjunct to low-intervention smoking cessation therapy. A randomized, placebo-controlled, double-blind study. *Arch Intern Med.* 1991;151:749-52.

Davies BL, Matte-Lewis L, O'Connor AM, Dulberg CS, Drake ER. Evaluation of the ”Time to Quit“ self-help smoking cessation program. *Can J Public Health.* 1992;83:19-23.

Davis AL, Faust R, Ordentlich M. Self-help smoking cessation and maintenance programs: A comparative study with 12-month follow-up by the American Lung Association. *Am J Public Health.* 1984;74:1212-7.

Davis JR, Glaros AG. Relapse prevention and smoking cessation. *Addict Behav.* 1986;11:105-14.

Davis SW, Cummings KM, Rimer BK, Sciandra R, Stone JC. The impact of tailored self-help smoking cessation guides on young mothers. *Health Educ Q.* 1992;19:495-504.

Demers RY, Neale AV, Adams R, Trembath C, Herman SC. The impact of physicians’ brief smoking cessation counseling: A MIRNET study. *J Fam Pract.* 1990;31:625-9.

Digiusto E, Bird KD. Matching smokers to treatment: Self-control versus social support. *J Consult Clin Psychol.* 1995;63:290-5.

Dijkstra A, De Vries H, Roijackers J. Long-term effectiveness of computer-generated tailored feedback in smoking cessation. *Health Educ Res.* 1998;13:207-14.

Dijkstra A, De Vries H, Roijackers J. Targeting smokers with low readiness to change with tailored and nontailored self-help materials. *Prev Med.* 1999;28:203-11.

Dow RJ, Fee WM. Use of beta-blocking agents with group therapy in a smoking withdrawal clinic. *J R Soc Med.* 1984;77:648-51.

Elliott CH, Denney DR. A multiple-component treatment approach to smoking reduction. *J Consult Clin Psychol.* 1978;46:1330-9.

Etringer BD, Gregory VR, Lando HA. Influence of group cohesion on the behavioral treatment of smoking. *J Consult Clin Psychol.* 1984;52:1080-6.

Fagerstrom KO. A comparison of psychological and pharmacological treatment in smoking cessation. *J Behav Med.* 1982;5:343-51.

Fagerstrom KO. Effects of nicotine chewing gum and follow-up appointments in physician-based smoking cessation. *Prev Med.* 1984;13:517-27.

Fagerstrom KO. Tolerance, withdrawal and dependence on tobacco and smoking termination. *Int Rev Appl Psych.* 1983;32:29-52.

Fee WM, Stewart MJ. A controlled trial of nicotine chewing gum in a smoking withdrawal clinic. *Practitioner.* 1982;226:148-51.

Fiore MC, Kenford SL, Jorenby DE, Wetter DW, Smith SS, Baker TB. Two studies of the clinical effectiveness of the nicotine patch with different counseling treatments. *Chest.* 1994;105:524-33.

Fisher EB, Auslander WF, Munro JF, Arfken CL, Brownson RC, Owens NW. Neighbors for a smoke free north side: Evaluation of a community organization approach to promoting smoking cessation among African Americans. *Am J Public Health.* 1998;88:1658-63.

Flay BR, Gruder CL, Warnecke RB, Jason LA, Peterson P. One year follow-up of the Chicago televised smoking cessation program. *Am J Public Health.* 1989;79:1377-80.

Fortmann SP, Killen JD. Nicotine gum and self-help behavioral treatment for smoking relapse prevention: Results from a trial using population-based recruitment. *J Consult Clin Psychol.* 1995;63:460-8.

Fortmann SP, Killen JD, Telch MJ, Newman B. Minimal contact treatment for smoking cessation. A placebo controlled trial of nicotine polacrilex and self-directed relapse prevention: Initial results of the Stanford Stop Smoking Project. *JAMA.* 1988;260:1575-80.

Gilbert JR, Wilson DM, Best JA, et al. Smoking cessation in primary care. A randomized controlled trial of nicotine-bearing chewing gum. *J Fam Pract.* 1989;28:49-55.

Gilbert JR, Wilson DM, Singer J, et al. A family physician smoking cessation program: An evaluation of the role of follow-up visits. *Am J Prev Med.* 1992;8:91-5.

Ginsberg D, Hall SM, Rosinski M. Partner support, psychological treatment, and nicotine gum in smoking treatment: An incremental study. *Int J Addict.* 1992;27:503-14.

Glasgow RE, Schafer L, O'Neill HK. Self-help books and amount of therapist contact in smoking cessation programs. *J Consult Clin Psychol.* 1981;49:659-67.

Glasgow RE, Terborg JR, Strycker LA, Boles SM, Hollis JF. Take Heart II: replication of a worksite health promotion trial. *J Behav Med.* 1997;20:143-61.

Glassman AH, Covey LS, Dalack GW, et al. Smoking cessation, clonidine, and vulnerability to nicotine among dependent smokers. *Clin Pharmacol Ther.* 1993;54:670-9.

Glassman AH, Stetner F, Walsh BT, et al. Heavy smokers, smoking cessation, and clonidine. Results of a double-blind, randomized trial. *JAMA.* 1988;259:2863-6.

Goldberg DN, Hoffman AM, Farinha MF, et al. Physician delivery of smoking-cessation advice based on the stages-of-change model. *Am J Prev Med.* 1994;10:267-74.

Goldberg R, Ockene JK, Kalan K, Kristeller J. Interventions for smoking prevention and cessation. In: National Cancer Institute. *Tobacco and the Clinician: Interventions for Medical and Dental Practice. NIH Publication No. 94-3693 Monogr Natl Cancer Inst.* 1994;5:191-206.

Goldstein MG, Niaura R, Follick MJ, Abrams DB. Effects of behavioral skills training and schedule of nicotine gum administration on smoking cessation. *Am J Psychiatry.* 1989;146:56-60.

Gourlay SG, Forbes A, Marriner T, Pethica D, McNeil JJ. Double blind trial of repeated treatment with transdermal nicotine for relapsed smokers. *BMJ.* 1995;311:363-6.

Gritz ER, Berman BA, Bastani R, Wu M. A randomized trial of a self-help smoking cessation intervention in a nonvolunteer female population: Testing the limits of the public health model. *Health Psychol.* 1992;11:280-9.

Gruder CL, Mermelstein RJ, Kirkendol S, et al. Effects of social support and relapse prevention training as adjuncts to a televised smoking-cessation intervention. *J Consult Clin Psychol.* 1993;61:113-20.

Hall SM, Munoz RF, Reus VI. Cognitive-behavioral intervention increases abstinence rates for depressive-history smokers. *J Consult Clin Psychol.* 1994;62:141-6.

Hall SM, Munoz RF, Reus VI, et al. Mood management and nicotine gum in smoking treatment: A therapeutic contact and placebo-controlled study. *J Consult Clin Psychol.* 1996;64:1003-9.

Hall SM, Reus VI, Munoz RF, Sees KL, Humfleet GL, Frederick S. Nortriptyline and cognitive behavioral treatment of cigarette smoking. CPDD 1996 Annual Meeting: San Juan, PR.

Hall SM, Tunstall CD, Ginsberg D, Benowitz NL, Jones RT. Nicotine gum and behavioral treatment: A placebo controlled trial. *J Consult Clin Psychol.* 1987;55:603-5.

Hamilton SB, Bornstein PH. Broad-spectrum behavioral approach to smoking cessation: Effects of social support and paraprofessional training on the maintenance of treatment effects. *J Consult Clin Psychol.* 1979;47:598-600.

Hao W, Young D, Hao W. Effect of clonidine on cigarette cessation and in the alleviation of withdrawal symptoms. *Br J Addict.* 1988;83:1221-6.

Harackiewicz JM, Blair LW, Sansone C, Epstein JA, Stuchell RN. Nicotine gum and self-help manuals in smoking cessation: An evaluation in a medical context. *Addict Behav.* 1988;13:319-30.

Harackiewicz JM, Sansone C, Blair LW, Epstein JA, Manderlink G. Attributional processes in behavior change and maintenance: Smoking cessation and continued abstinence. *J Consult Clin Psychol.* 1987;55:372-8.

Hayford KE, Patten CA, Rummans TA, et al. Efficacy of bupropion for smoking cessation in smokers with a former history of major depression or alcoholism. *Br J Psychiatry.* 1999;174:173-8.

Herrera N, Franco R, Herrera L, Partidas A, Rolando R, Fagerstrom KO. Nicotine gum, 2 and 4 mg, for nicotine dependence. A double-blind placebo-controlled trial within a behavior modification support program. *Chest.* 1995;108:447-51.

Hill R, Rigdon M, Johnson S. Behavioral smoking cessation treatment for older chronic smokers. *Behav Ther.* 1993;24:321-9.

Hilleman DE, Mohiuddin SM, Delcore MG. Comparison of fixed-dose transdermal nicotine, tapered-dose transdermal nicotine, and buspirone in smoking cessation. *J Clin Pharmacol.* 1994;34:222-4.

Hilleman DE, Mohiuddin SM, Delcore MG, Lucas Jr. BD. Randomized, controlled trial of transdermal clonidine for smoking cessation. *Ann Pharmacother.* 1993;27:1025-8.

Hjalmarson A, Franzon M, Westin A, Wiklund O. Effect of nicotine nasal spray on smoking cessation. A randomized, placebo-controlled, double-blind study. *Arch Intern Med.* 1994;154:2567-72.

Hjalmarson A, Nilsson F, Sjostrom L, Wiklund O. The nicotine inhaler in smoking cessation. *Arch Intern Med.* 1997;157:1721-8.

Hjalmarson AI. Effect of nicotine chewing gum in smoking cessation. A randomized, placebo-controlled, double-blind study. *JAMA.* 1984;252:2835-8.

Hjermann I, Velve Byre K, Holme I, Leren P. Effect of diet and smoking intervention on the incidence of coronary heart disease. Report from the Oslo Study Group of a randomised trial in healthy men. *Lancet.* 1981;2:1303-10.

Hollis JF, Lichtenstein E, Vogt TM, Stevens VJ, Biglan A. Nurse-assisted counseling for smokers in primary care. *Ann Intern Med.* 1993;118:521-5.

Huber D. Combined and separate treatment effects of nicotine chewing gum and self-control method. *Pharmacopsychiatry.* 1988;21:461-2.

Hughes JR, Gust SW, Keenan RM, Fenwick JW. Effect of dose on nicotine's reinforcing, withdrawal-suppression and self-reported effects. *J Pharmacol Exp Ther.* 1990;252:1175-83.

Hughes JR, Gust SW, Keenan RM, Fenwick JW, Healey ML. Nicotine vs. placebo gum in general medical practice. *JAMA.* 1989;261:1300-5.

Hughes JR, Wadland WC, Fenwick JW, Lewis J, Bickel WK. Effect of cost on the self-administration and efficacy of nicotine gum: A preliminary study. *Prev Med.* 1991;20:486-96.

Humerfelt S, Eide GE, Kvale G, Aaro LE, Gulsvik A. Effectiveness of postal smoking cessation advice: A randomized controlled trial in young men with reduced FEV1 and asbestos exposure. *Eur Respir J.* 1998;11:284-90.

Hurt RD, Dale LC, Fredrickson PA, et al. Nicotine patch therapy for smoking cessation combined with physician advice and nurse follow-up. One-year outcome and percentage of nicotine replacement. *JAMA.* 1994;271:595-600.

Hurt RD, Glover ED, Sachs DPL, et al. Buproprion for smoking cessation: A double-blind, placebo-controlled dose response trial. *J Addict Dis.* 1996;15:137.

Hurt RD, Sachs DP, Glover ED, et al. A comparison of sustained-release bupropion and placebo for smoking cessation. *N Engl J Med.* 1997;337:1195-202.

Jacobs MA, Spilken AZ, Norman MM, Wohlberg GW, Knapp PH. Interaction of personality and treatment conditions associated with success in a smoking control program. *Psychosom Med.* 1971;33:545-56.

Jamrozik K, Fowler G, Vessey M, Wald N. Placebo controlled trial of nicotine chewing gum in general practice. *Br Med J (Clin Res Ed).* 1984;289:794-7.

Jamrozik K, Vessey M, Fowler G, Wald N, Parker G, Van Vunakis H. Controlled trial of three different antismoking interventions in general practice. *Br Med J (Clin Res Ed).* 1984;288:1499-503.

Janz NK, Becker MH, Kirscht JP, Eraker SA, Billi JE, Woolliscroft JO. Evaluation of a minimal-contact smoking cessation intervention in an outpatient setting. *Am J Public Health.* 1987;77:805-9.

Jarvik ME, Schneider NG. Degree of addiction and effectiveness of nicotine gum therapy for smoking. *Am J Psychiatry.* 1984;141:790-1.

Jarvis MJ, Raw M, Russell MA, Feyerabend C. Randomised controlled trial of nicotine chewing-gum. *Br Med J (Clin Res Ed).* 1982;285:537-40.

Jason LA, Gruder CL, Buckenberger L, et al. A 12-month follow-up of a worksite smoking cessation intervention. *Health Educ Res.* 1987;2:185-94.

Jason LA, Lesowitz T, Michaels M, et al. A worksite smoking cessation intervention involving the media and incentives. *Am J Community Psychol.* 1989;17:785-99.

Jason LA, McMahon SD, Salina D, et al. Assessing a smoking cessation intervention involving groups, incentives and self-help manuals. *Behav Ther.* 1995;26:393-408.

Jason LA, Salina D, McMahon SD, Hedeker D, Stockton M. A worksite smoking intervention: A 2 year assessment of groups, incentives, and self-help. *Health Educ Res.* 1997;12:129-38.

Jeffery RW, Hellerstedt WL, Schmid TL. Correspondence programs for smoking cessation and weight control: A comparison of two strategies in the Minnesota Heart Health Program. *Health Psychol.* 1990;9:585-98.

Jensen EJ, Schmidt E, Pedersen B, Dahl R. Effect of nicotine, silver acetate, and ordinary chewing gum in combination with group counseling on smoking cessation. *Thorax.* 1990;45:831-4.

Jensen EJ, Schmidt E, Pedersen B, Dahl R. The effect of nicotine, silver acetate, and placebo chewing gum on the cessation of smoking. The influence of smoking type and nicotine dependence. *Int J Addict.* 1991;26:1223-31.

Jorenby DE, Leischow SJ, Nides MA, et al. A controlled trial of sustained-release bupropion, a nicotine patch, or both for smoking cessation. *N Engl J Med.* 1999;340:685-91.

Jorenby DE, Smith SS, Fiore MC, et al. Varying nicotine patch dose and type of smoking cessation counseling. *JAMA.* 1995;274:1347-52.

Joseph AM, Norman SM, Ferry LH, et al. The safety of transdermal nicotine as an aid to smoking cessation in patients with cardiac disease. *N Engl J Med.* 1996;335:1792-8.

Kenford SL, Fiore MC, Jorenby DE, Smith SS, Wetter D, Baker TB. Predicting smoking cessation. Who will quit with and without the nicotine patch. *JAMA.* 1994;271:589-94.

Killen JD, Fortmann SP, Davis L, Varady A. Nicotine patch and self-help video for cigarette smoking cessation. *J Consult Clin Psychol.* 1997;65:663-72.

Killen JD, Maccoby N, Taylor CB. Nicotine gum and self-regulation training in smoking relapse prevention. *Behav Ther.* 1984;15:234-48.

Kornitzer M, Boutsen M, Dramaix M, Thijs J, Gustavsson G. Combined use of nicotine patch and gum in smoking cessation: A placebo-controlled clinical trial. *Prev Med.* 1995;24:41-7.

Kornitzer M, Kittel F, Dramaix M, Bourdoux P. A double blind study of 2 mg versus 4 mg nicotine-gum in an industrial setting. *J Psychosom Res.* 1987;31:171-6.

Kottke TE, Brekke ML, Solberg LI, Hughes JR. A randomized trial to increase smoking intervention by physicians. Doctors Helping Smokers, Round I. *JAMA.* 1989;261:2101-6.

Lando HA. Effects of preparation, experimenter contact, and a maintained reduction alternative on a broad-spectrum program for eliminating smoking. *Addict Behav.* 1981;6:123-133.

Lando HA, Kalb EA, McGovern PG. Behavioral self-help materials as an adjunct to nicotine gum. *Addict Behav.* 1988;13:181-4.

Lando HA, McGovern PG. The influence of group cohesion on the behavioral treatment of smoking: A failure to replicate. *Addict Behav.* 1991;16:111-21.

Lando HA, McGovern PG, Barrios FX, Etringer BD. Comparative evaluation of American Cancer Society and American Lung Association smoking cessation clinics. *Am J Public Health.* 1990;80:554-9.

Lando HA, Pirie PL, McGovern PG, Pechacek TF, Swim J, Loken B. A comparison of self-help approaches to smoking cessation. *Addict Behav.* 1991;16:183-93.

Lando HA, Rolnick S, Klevan D, Roski J, Cherney L, Lauger G. Telephone support as an adjunct to transdermal nicotine in smoking cessation. *Am J Public Health.* 1997;87:1670-4.

Ledwith F. Immediate and delayed effects of postal advice on stopping smoking. *Health Bull (Edinb).* 1984;42:332-44.

Leischow SJ, Nilsson F, Franzon M, Hill A, Otte P, Merikle EP. Efficacy of the nicotine inhaler as an adjunct to smoking cessation. *American Journal of Health Behavior.* 1996;20:364-71.

Leung J. Smoking cessation by auricular acupuncture and behavioural therapy. *Psychologia.* 1991;34:177-87.

Lewis SF, Piasecki TM, Fiore MC, Anderson JE, Baker TB. Transdermal nicotine replacement for hospitalized patients: A randomized clinical trial. *Prev Med.* 1998;27:296-303.

Li VC, Kim YJ, Ewart CK, et al. Effects of physician counseling on the smoking behavior of asbestos-exposed workers. *Prev Med.* 1984;13:462-76.

Lindsay EA, Wilson DM, Best JA, et al. A randomized trial of physician training for smoking cessation. *Am J Health Promot.* 1989;3:11-8.

Lowe MR, Green L, Kurtz SM, Ashenberg ZS, Fisher Jr. EB. Self-initiated, cue extinction, and covert sensitization procedures in smoking cessation. *J Behav Med.* 1980;3:357-72.

Malcolm RE, Sillett RW, Turner JA, Ball KP. The use of nicotine chewing gum as an aid to stopping smoking. *Psychopharmacology (Berl).* 1980;70:295-6.

Marshall A, Raw M. Nicotine chewing gum in general practice: Effect of follow up appointments. *Br Med J (Clin Res Ed).* 1985;290:1397-8.

Martin JE, Calfas KJ, Patten CA, et al. Prospective evaluation of three smoking interventions in 205 recovering alcoholics: One-year results of Project SCRAP-Tobacco. *J Consult Clin Psychol.* 1997;65:190-4.

McDowell I, Mothersill KJ, Rosser W, Hartman R. A randomized trial of three approaches to smoking cessation. *Can Fam Physician.* 1985;31:845-51.

McFall SL, Michener A, Rubin D, et al. The effects and use of maintenance newsletters in a smoking cessation intervention. *Addict Behav.* 1993;18:151-8.

McGovern PG, Lando HA. An assessment of nicotine gum as an adjunct to freedom from smoking cessation clinics. *Addict Behav.* 1992;17:137-47.

Meenan RT, Stevens VJ, Hornbrook MC, et al. Cost-effectiveness of a hospital-based smoking cessation intervention. *Med Care.* 1998;36:670-8.

Mogielnicki RP, Neslin S, Dulac J, Balestra D, Gillie E, Corson J. Tailored media can enhance the success of smoking cessation clinics. *J Behav Med.* 1986;9:141-61.

Morgan GD, Noll EL, Orleans CT, Rimer BK, Amfoh K, Bonney G. Reaching midlife and older smokers: Tailored interventions for routine medical care. *Prev Med.* 1996;25:346-54.

Mothersill KJ, McDowell I, Rosser W. Subject characteristics and long term post-program smoking cessation. *Addict Behav.* 1988;13:29-36.

Multiple Risk Factor Intervention Trial Research Group. Multiple risk factor intervention trial. Risk factor changes and mortality results. Multiple Risk Factor Intervention Trial Research Group. *JAMA.* 1982;248:1465-77.

Nakamura M, Saito J, Oshima A, Miyamoto M, Matushita A, Endo S. Effect of nicotine chewing gum in smoking cessation classes. 7th World Conference on Tobacco and Health: Perth, Western Australia.

Nebot M, Cabezas C. Does nurse counseling or offer of nicotine gum improve the effectiveness of physician smoking-cessation advice? *Fam Pract Res J.* 1992;12:263-70.

Nevid JS, Javier RA. Preliminary investigation of a culturally specific smoking cessation intervention for Hispanic smokers. *Am J Health Promot.* 1997;11:198-207.

Niaura R, Goldstein MG, Abrams DB. Matching high- and low-dependence smokers to self-help treatment with or without nicotine replacement. *Prev Med.* 1994;23:70-7.

Nyborg KF, Nevid JS. Couples who smoke: A comparison of couples training versus individual training for smoking cessation. *Behav Ther.* 1986;17:620-5.

Ockene JK, Kristeller J, Goldberg R, et al. Increasing the efficacy of physician-delivered smoking interventions: A randomized clinical trial. *J Gen Intern Med.* 1991;6:1-8.

Ockene JK, Kristeller J, Pbert L, et al. The physician-delivered smoking intervention project: Can short-term interventions produce long-term effects for a general outpatient population? *Health Psychol.* 1994;13:278-81.

Omenn GS, Thompson B, Sexton M, et al. A randomized comparison of worksite-sponsored smoking cessation programs. *Am J Prev Med.* 1988;4:261-7.

Orleans CT, Schoenbach VJ, Wagner EH, et al. Self-help quit smoking interventions: Effects of self-help materials, social support instructions, and telephone counseling. *J Consult Clin Psychol.* 1991;59:439-48.

Ossip-Klein DJ, Carosella AM, Krusch DA. Self-help interventions for older smokers. *Tob Control.* 1997;6:188-93.

Ossip-Klein DJ, Giovino GA, Megahed N, et al. Effects of a smoker's hotline: Results of a 10-county self-help trial. *J Consult Clin Psychol.* 1991;59:325-32.

Owen N, Ewins AL, Lee C. Smoking cessation by mail: A comparison of standard and personalized correspondence course formats. *Addict Behav.* 1989;14:355-63.

Page AR, Walters DJ, Schlegel RP, Best JA. Smoking cessation in family practice: The effects of advice and nicotine chewing gum prescription. *Addict Behav.* 1986;11:443-6.

Pallonen UE, Leskinen L, Prochaska JO, Willey CJ, Kaariainen R, Salonen JT. A 2-year self-help smoking cessation manual intervention among middle-aged Finnish men: An application of the transtheoretical model. *Prev Med.* 1994;23:507-14.

Paoletti P, Fornai E, Maggiorelli F, et al. Importance of baseline cotinine plasma values in smoking cessation: Results from a double-blind study with nicotine patch. *Eur Respir J.* 1996;9:643-51.

Patten CA, Martin JE, Myers MG, Calfas KJ, Williams CD. Effectiveness of cognitive-behavioral therapy for smokers with histories of alcohol dependence and depression. *J Stud Alcohol.* 1998;59:327-35.

Pederson LL, Baldwin N, Lefcoe NM. Utility of behavioral self-help manuals in a minimal-contact smoking cessation program. *Int J Addict.* 1981;16:1233-9.

Pederson LL, Wood T, Lefcoe NM. Use of a self-help smoking cessation manual as an adjunct to advice from a respiratory specialist. *Int J Addict.* 1983;18:777-82.

Pierce JP, Gilpin EA, Emery SL, et al. Has the California tobacco control program reduced smoking? *JAMA.* 1998;280:893-9.

Pirie PL, McBride CM, Hellerstedt W, et al. Smoking cessation in women concerned about weight. *Am J Public Health.* 1992;82:1238-43.

Porter AM, McCullough DM. Counseling against cigarette smoking. A controlled study from a general practice. *Practitioner.* 1972;209:686-9.

Powell DR, McCann BS. The effects of a multiple treatment program and maintenance procedures on smoking cessation. *Prev Med.* 1981;10:94-104.

Prochaska JO, DiClemente CC, Velicer WF, Rossi JS. Standardized, individualized, interactive, and personalized self-help programs for smoking cessation. *Health Psychol.* 1993;12:399-405.

Prue DM, Davis CJ, Martin JE, Moss RA. An investigation of a minimal contact brand fading program for smoking treatment. *Addict Behav.* 1983;8:307-10.

Puska P, Bjorkqvist S, Koskela K. Nicotine-containing chewing gum in smoking cessation: A double blind trial with half year follow-up. *Addict Behav.* 1979;4:141-6.

Puska P, Korhonen HJ, Vartiainen E, Urjanheimo EL, Gustavsson G, Westin A. Combined use of nicotine patch and gum compared with gum alone in smoking cessation: A clinical trial in North Karelia. *Tobacco Control.* 1995;4:231-5.

Rabkin SW, Boyko E, Shane F, Kaufert J. A randomized trial comparing smoking cessation programs utilizing behaviour modification, health education or hypnosis. *Addict Behav.* 1984;9:157-73.

Resnicow K, Vaughan R, Futterman R, et al. A self-help smoking cessation program for inner-city African Americans: Results from the Harlem Health Connection Project. *Health Educ Behav.* 1997;24:201-17.

Rice VH, Fox DH, Lepczyk M, et al. A comparison of nursing interventions for smoking cessation in adults with cardiovascular health problems. *Heart Lung.* 1994;23:473-86.

Richmond RL, Austin A, Webster IW. Three year evaluation of a programme by general practitioners to help patients to stop smoking. *Br Med J (Clin Res Ed).* 1986;292:803-6.

Richmond RL, Harris K, de Almeida Neto A. The transdermal nicotine patch: Results of a randomised placebo- controlled trial. *Med J Aust.* 1994;161:130-5.

Richmond RL, Kehoe L, de Almeida Neto AC. Effectiveness of a 24-hour transdermal nicotine patch in conjunction with a cognitive behavioural programme: One year outcome. *Addiction.* 1997;92:27-31.

Richmond RL, Makinson RJ, Giugni AA, Webster IW. General practitioner smoking interventions in Australia: Results of studies over the past ten years. 7th World Conference on Tobacco and Health: Perth, Western Australia. 657-60.

Rigotti NA, Arnsten JH, McKool KM, Wood-Reid KM, Pasternak RC, Singer DE. Efficacy of a smoking cessation program for hospital patients. *Arch Intern Med.* 1997;157:2653-60.

Rimer BK, Orleans CT. Tailoring smoking cessation for older adults. *Cancer.* 1994;74:2051-4.

Rimer BK, Orleans CT, Fleisher L, Cristinzio S. Does tailoring matter? The impact of tailored guides on ratings and short-term smoking-related outcomes for older smokers. *Health Educ Res.* 1994;9:69-84.

Risser NL, Belcher DW. Adding spirometry, carbon monoxide, and pulmonary symptom results to smoking cessation counseling: A randomized trial. *J Gen Intern Med.* 1990;5:16-22.

Rosal MC, Ockene JK, Ma Y, et al. Coronary Artery Smoking Intervention Study (CASIS): 5-year follow-up. *Health Psychol.* 1998;17:476-8.

Rose G, Hamilton PJ. A randomised controlled trial of the effect on middle-aged men of advice to stop smoking. *J Epidemiol Community Health.* 1978;32:275-81.

Rose JE, Behm FM, Westman EC, Levin ED, Stein RM, Ripka GV. Mecamylamine combined with nicotine skin patch facilitates smoking cessation beyond nicotine patch treatment alone. *Clin Pharmacol Ther.* 1994;56:86-99.

Rose JE, Westman EC, Behm FM. Nicotine/Mecamylamine combination treatment for smoking cessation. *Drug Dev Res.* 1996;38:243-56.

Rosser WW. The role of the family physician in smoking cessation. *Can Fam Physician.* 1984;30:160-7.

Russell MA, Merriman R, Stapleton J, Taylor W. Effect of nicotine chewing gum as an adjunct to general practitioner's advice against smoking. *Br Med J (Clin Res Ed).* 1983;287:1782-5.

Russell MA, Stapleton JA, Jackson PH, Hajek P, Belcher M. District programme to reduce smoking: Effect of clinic supported brief intervention by general practitioners. *Br Med J (Clin Res Ed).* 1987;295:1240-4.

Russell MA, Wilson C, Taylor C, Baker CD. Effect of general practitioners' advice against smoking. *Br Med J.* 1979;2:231-5.

Sachs DP, Sawe U, Leischow SJ. Effectiveness of a 16-hour transdermal nicotine patch in a medical practice setting, without intensive group counseling. *Arch Intern Med.* 1993;153:1881-90.

Salina D, Jason LA, Hedeker D, et al. A follow-up of a media-based, worksite smoking cessation program. *Am J Community Psychol.* 1994;22:257-71.

Sawicki PT, Didjurgeit U, Muhlhauser I, Berger M. Behaviour therapy versus doctor's anti-smoking advice in diabetic patients. *J Intern Med.* 1993;234:407-9.

Schneider NG, Jarvik ME. Nicotine gum vs. placebo gum: Comparisons of withdrawal symptoms and success rates. *NIDA Res Monogr.* 1985;53:83-101.

Schneider NG, Jarvik ME, Forsythe AB, Read LL, Elliott ML, Schweiger A. Nicotine gum in smoking cessation: A placebo-controlled, double-blind trial. *Addict Behav.* 1983;8:253-61.

Schneider NG, Olmstead R, Mody FV, et al. Efficacy of a nicotine nasal spray in smoking cessation: A placebo-controlled, double-blind trial. *Addiction.* 1995;90:1671-82.

Schneider NG, Olmstead R, Nilsson F, Mody FV, Franzon M, Doan K. Efficacy of a nicotine inhaler in smoking cessation: A double-blind, placebo-controlled trial. *Addiction.* 1996;91:1293-306.

Schneider NG, Olmstead RE, Steinberg C, Sloan K, Daims RM, Brown HV. Efficacy of buspirone in smoking cessation: A placebo-controlled trial. *Clin Pharmacol Ther.* 1996;60:568-75.

Schorling JB, Roach J, Siegel M, et al. A trial of church-based smoking cessation interventions for rural African Americans. *Prev Med.* 1997;26:92-101.

Schwartz JL, Dubitzky M. One-year follow-up results of a smoking cessation program. *Can J Public Health.* 1968;59:161-5.

Segnan N, Ponti A, Battista RN, et al. A randomized trial of smoking cessation interventions in general practice in Italy. *Cancer Causes Control.* 1991;2:239-46.

Severson HH, Andrews JA, Lichtenstein E, Gordon JS, Barckley MF. Using the hygiene visit to deliver a tobacco cessation program: results of a randomized clinical trial. *J Am Dent Assoc.* 1998;129:993-9.

Simon JA, Solkowitz SN, Carmody TP, Browner WS. Smoking cessation after surgery. A randomized trial. *Arch Intern Med.* 1997;157:1371-6.

Slama K, Karsenty S, Hirsch A. Effectiveness of minimal intervention by general practitioners with their smoking patients: A randomised controlled. *Tobacco Control.* 1995;4:162-9.

Slama K, Redman S, Perkins J, Reid AL, Sanson-Fisher RW. The effectiveness of two smoking cessation programmes for use in general practice: A randomised clinical trial. *BMJ.* 1990;300:1707-9.

Sonderskov J, Olsen J, Sabroe S, Meillier L, Overvad K. Nicotine patches in smoking cessation: A randomized trial among over-the-counter customers in Denmark. *Am J Epidemiol.* 1997;145:309-18.

Stapleton JA, Russell MA, Feyerabend C, et al. Dose effects and predictors of outcome in a randomized trial of transdermal nicotine patches in general practice. *Addiction.* 1995;90:31-42.

Stapleton JA, Sutherland G, Russell MA. How much does relapse after one year erode effectiveness of smoking cessation treatments? Long-term follow up of randomised trial of nicotine nasal spray. *BMJ.* 1998;316:830-1.

Stevens VJ, Glasgow RE, Hollis JF, Lichtenstein E, Vogt TM. A smoking-cessation intervention for hospital patients. *Med Care.* 1993;31:65-72.

Stevens VJ, Hollis JF. Preventing smoking relapse, using an individually tailored skills-training technique. *J Consult Clin Psychol.* 1989;57:420-4.

Stewart PJ, Rosser WW. The impact of routine advice on smoking cessation from family physicians. *Can Med Assoc J.* 1982;126:1051-4.

Strecher VJ, Kreuter M, Den Boer DJ, Kobrin S, Hospers HJ, Skinner CS. The effects of computer-tailored smoking cessation messages in family practice settings. *J Fam Pract.* 1994;39:262-70.

Strecher VJ, O'Malley MS, Villagra VG, et al. Can residents be trained to counsel patients about quitting smoking? Results from a randomized trial. *J Gen Intern Med.* 1991;6:9-17.

Strecher VJ, O'Malley MS, Villagra VG, et al. Effects of two realistic interventions to teach smoking cessation counseling to primary care residents: A randomized trial. In: National Cancer Institute. *Tobacco and the Clinician: Interventions for Medical and Dental Practice. NIH Publication No. 94-3693 Monogr Natl Cancer Inst.* 1994;5:207-22.

Sutherland G, Stapleton JA, Russell MA, et al. Randomised controlled trial of nasal nicotine spray in smoking cessation. *Lancet.* 1992;340:324-9.

Sutton S, Hallett R. Randomized trial of brief individual treatment for smoking using nicotine chewing gum in a workplace setting. *Am J Public Health.* 1987;77:1210-1.

Sutton S, Hallett R. Smoking intervention in the workplace using videotapes and nicotine chewing gum. *Prev Med.* 1988;17:48-59.

Taylor CB, Miller NH, Herman S, et al. A nurse-managed smoking cessation program for hospitalized smokers. *Am J Public Health.* 1996;86:1557-60.

Thompson B, Kinne S, Lewis FM, Woolridge JA. Randomized telephone smoking-intervention trial initially directed at blue-collar workers. *J Natl Cancer Inst Monogr.* 1993:105-12.

Thompson RS, Michnich ME, Friedlander L, Gilson B, Grothaus LC, Storer B. Effectiveness of smoking cessation interventions integrated into primary care practice. *Med Care.* 1988;26:62-76.

Tiffany ST, Martin EM, Baker TB. Treatments for cigarette smoking: An evaluation of the contributions of aversion and counseling procedures. *Behav Res Ther.* 1986;24:437-52.

Tonnesen P, Fryd V, Hansen M, et al. Effect of nicotine chewing gum in combination with group counseling on the cessation of smoking. *N Engl J Med.* 1988;318:15-8.

Tonnesen P, Fryd V, Hansen M, et al. Two and four mg nicotine chewing gum and group counseling in smoking cessation: An open, randomized, controlled trial with a 22 month follow-up. *Addict Behav.* 1988;13:17-27.

Tonnesen P, Norregaard J, Mikkelsen K, Jorgensen S, Nilsson F. A double-blind trial of a nicotine inhaler for smoking cessation. *JAMA.* 1993;269:1268-71.

Tonnesen P, Norregaard J, Simonsen K, Sawe U. A double-blind trial of a 16-hour transdermal nicotine patch in smoking cessation. *N Engl J Med.* 1991;325:311-5.

Velicer WF, Prochaska JO, Fava JL, Laforge RG, Rossi JS. Interactive versus noninteractive interventions and dose-response relationships for stage-matched smoking cessation programs in a managed care setting. *Health Psychol.* 1999;18:21-8.

Vetter NJ, Ford D. Smoking prevention among people aged 60 and over: A randomized controlled trial. *Age Ageing.* 1990;19:164-8.

Villagra VG. Transdermal clonidine for smoking cessation: A randomized trial. *Clin Res.* 1991;39:640A.

Villagra VG, Rosenberger JL, Girolami S. Transdermal clonidine for smoking cessation: A randomized, double-blind, placebo controlled trial. *Circulation (Supp II).* 1989;80:II-58.

Weissfeld JL, Holloway JL. Treatment for cigarette smoking in a Department of Veterans Affairs outpatient clinic. *Arch Intern Med.* 1991;151:973-7.

Westman EC, Levin ED, Rose JE. The nicotine patch in smoking cessation. A randomized trial with telephone counseling. *Arch Intern Med.* 1993;153:1917-23.

Wilson D, Wood G, Johnston N, Sicurella J. Randomized clinical trial of supportive follow-up for cigarette smokers in a family practice. *Can Med Assoc J.* 1982;126:127-9.

Wilson DH, Wakefield MA, Steven ID, Rohrsheim RA, Esterman AJ, Graham NM. ”Sick of Smoking“: Evaluation of a targeted minimal smoking cessation intervention in general practice. *Med J Aust.* 1990;152:518-21.

Wilson DM, Taylor DW, Gilbert JR, et al. A randomized trial of a family physician intervention for smoking cessation. *JAMA.* 1988;260:1570-4.

Windsor RA, Lowe JB. Behavioral impact and cost analysis of a worksite self-help smoking cessation program. *Prog Clin Biol Res.* 1989;293:231-42.

Zelman DC. Treatments for cigarette smoking: The contribution of counseling and nicotine replacement strategies (Doctoral dissertation, University of Wisconsin - Madison, 1989). *Dissertation Abstracts International.* 1989;50:5899.

Zelman DC, Brandon TH, Jorenby DE, Baker TB. Measures of affect and nicotine dependence predict differential response to smoking cessation treatments. *J Consult Clin Psychol.* 1992;60:943-52.

Zhu SH, Stretch V, Balabanis M, Rosbrook B, Sadler G, Pierce JP. Telephone counseling for smoking cessation: Effects of single-session and multiple-session interventions. *J Consult Clin Psychol.* 1996;64:202-11.

ARTICLES REJECTED FOR THIS REVIEW

Cost-effectiveness of practice guidelines for smoking cessation. *Addiction.* 1998;93:447-8.

Effectiveness of a nicotine patch in helping people stop smoking: Results of a randomised trial in general practice. Imperial Cancer Research Fund General Practice Research Group. *BMJ.* 1993;306:1304-8.

Abelin T, Buehler A, Muller P, Vesanen K, Imhof PR. Controlled trial of transdermal nicotine patch in tobacco withdrawal. *Lancet.* 1989;1:7-10.

Abrams DB, Orleans CT, Niaura RN, Goldstein MG, Prochaska JO, Velicer W. Integrating individual and public health perspectives for treatment of tobacco dependence under managed health care: A combined stepped care and matching model. *Ann Behav Med.* In press.

Abrams DB, Orleans CT, Niaura RN, Goldstein MG, Prochaska JO, Velicer W. Treatment issues in smoking cessation: A stepped care approach. *Tob Control.* 1993;2:17-34.

Altman DG, Flora JA, Fortmann SP, Farquhar JW. The cost-effectiveness of three smoking cessation programs. *Am J Public Health.* 1987;77:162-5.

Anda RF, Remington PL, Sienko DG, Davis RM. Are physicians advising smokers to quit? The patient's perspective. *JAMA.* 1987;257:1916-9.

Aparici M, Fernandez Gonzalez AL, Alegria E. [Clonidine in the treatment of tobacco withdrawal. A comparison with nicotine chewing gum]. *Rev Clin Esp.* 1994;194:453-6.

Appel D. Clonidine helps cigarette smokers stop smoking. *Am Rev Respir Dis.* 1987;135:354.

Baluch WM. Pharmacists' role in a smoking-cessation program at a health maintenance organization. *Am J Health Syst Pharm.* 1995;52:287-93.

Bartecchi CE, MacKenzie TD, Schrier RW. The human costs of tobacco use (1). *N Engl J Med.* 1994;330:907-12.

Bartlett WA, Whitehead RW. The effectiveness of meprobamate and lobeline as smoking deterrents. *J Lab Clin Med.* 1957;50:278-81.

Berlin I, Said S, Spreux-Varoquaux O, et al. A reversible monoamine oxidase A inhibitor (moclobemide) facilitates smoking cessation and abstinence in heavy, dependent smokers. *Clin Pharmacol Ther.* 1995;58:444-52.

Bernstein DA. The modification of smoking behavior: A search for effective variables. *Behav Res Ther.* 1970;8:133-46.

Bertera RL, Oehl LK, Telephak JM. Self-help versus group approaches to smoking cessation in the workplace: Eighteen-month follow-up and cost analysis. *Am J Health Promot.* 1990;4:187-92.

Betson CL, Lam TH, Chung TWH, Chung SF. A randomized controlled trial of smoking cessation in government out-patient clinics in Hong Kong. 10th World Conference on Tobacco and Health: Beijing, China.

Biener L, Abrams DB. The Contemplation Ladder: Validation of a measure of readiness to consider smoking cessation. *Health Psychol.* 1991;10:360-5.

Blondal T, Ludviksdottir D, Gudmundsson L, Olafsdottir I, Gustavsson G, Westin A. Efficacy of nicotine nasal spray added to transdermal nicotine patches in smoking cessation. 10th World Conference on Tobacco and Health: Beijing, China.

Boer HR. Best Practices for Smoking Cessation Intervention Model for Hospitalized Patients. Campbell F Kentucky: 1998;KY037: 5.

Borland R, Owen N, Hill D, Chapman S. Changes in acceptance of workplace smoking bans following their implementation: A prospective study. *Prev Med.* 1990;19:314-22.

Borrelli B, Mermelstein R. The role of weight concern and self-efficacy in smoking cessation and weight gain among smokers in a clinic-based cessation program. *Addict Behav.* 1998;23:609-22.

Borrelli B, Niaura R, Keuthen NJ, et al. Development of major depressive disorder during smoking-cessation treatment. *J Clin Psychiatry.* 1996;57:534-8.

Brandon TH, Tiffany ST, Baker TB. The process of smoking relapse. *NIDA Res Monogr.* 1986;72:104-17.

Brenner H, Fleischle BMM. Social acceptance of smoking regulations in the workplace. *Eur J Public Health.* 1994;4:17-21.

Brigden LP, Peck SH, Coy P. The development and implementation of a revised municipal bylaw to control environmental tobacco smoke. *Can J Public Health.* 1993;84:118-21.

Brink SG, Gottlieb NH, McLeroy KR, Wisotzky M, Burdine JN. A community view of smoking cessation counseling in the practices of physicians and dentists. *Public Health Rep.* 1994;109:135-42.

Brownson RC, Jackson-Thompson J, Wilkerson JC, Davis JR, Owens NW, Fisher Jr. EB. Demographic and socioeconomic differences in beliefs about the health effects of smoking. *Am J Public Health.* 1992;82:99-103.

Buchkremer G, Bents H, Horstmann M, Opitz K, Tolle R. Combination of behavioral smoking cessation with transdermal nicotine substitution. *Addict Behav.* 1989;14:229-38.

Buchkremer G, Bents H, Minneker E, Opitz K. [Long-term effects of a combination of transdermal nicotine administration with behavior therapy for smoking cessation]. *Nervenarzt.* 1988;59:488-90.

Bunney R. Paying for nicotine replacement therapy is cheaper than smoking $\leq$ 20 cigarettes a day. *British Medical Journal.* 1999;318:604-5.

Burnette MM, Meilahn E, Wing RR, Kuller LH. Smoking cessation, weight gain, and changes in cardiovascular risk factors during menopause: the Healthy Women Study. *Am J Public Health.* 1998;88:93-6.

Burton S, Campbell IA, Prescott RJ. Nicotine patches versus placebo in 235 hospital patients. 8th World Conference on Tobacco and Health: Buenos Aires, Argentina.

Carpenter CR. Promoting tobacco cessation in the military: An example for primary care providers. *Mil Med.* 1998;163:515-8.

Centers for Disease Control. Cigarette smoking among blacks and other minority populations. *MMWR Morb Mortal Wkly Rep.* 1987;36:404-7.

Centers for Disease Control. Physician and other health-care professional counseling of smokers to quit--United States, 1991. *MMWR Morb Mortal Wkly Rep.* 1993;42:854-7.

Cepeda-Benito A. Meta-analytical review of the efficacy of nicotine chewing gum in smoking treatment programs. *J Consult Clin Psychol.* 1993;61:822-30.

Christen AG, McDonald Jr. JL, Olson BL, Drook CA, Stookey GK. Efficacy of nicotine chewing gum in facilitating smoking cessation. *J Am Dent Assoc.* 1984;108:594-7.

Cohen SJ, Christen AG, Katz BP, et al. Counseling medical and dental patients about cigarette smoking: The impact of nicotine gum and chart reminders. *Am J Public Health.* 1987;77:313-6.

Conger B, Nelson EC, Dietrich AJ, et al. Effectiveness of physician antismoking advice. *Am J Prev Med.* 1987;3:223-6.

Covey LS, Glassman AH. A meta-analysis of double-blind placebo-controlled trials of clonidine for smoking cessation. *Br J Addict.* 1991;86:991-8.

Cox JL. Smoking cessation in the elderly patient. *Clin Chest Med.* 1993;14:423-8.

Cox LS, Christen AG, Tiffany ST. An evaluation of the psychometric properties of the brief form of the questionnaire of smoking urges (QSU-Brief). *Journal of Addictive Diseases.* 1997;16:124.

Croghan IT, Offord KP, Evans RW, et al. Cost-effectiveness of treating nicotine dependence: The Mayo Clinic experience. *Mayo Clin Proc.* 1997;72:917-24.

Cromwell J, Bartosch WJ, Fiore MC, Hasselblad V, Baker T. Cost-effectiveness of the clinical practice recommendations in the AHCPR guideline for smoking cessation. Agency for Health Care Policy and Research. *JAMA.* 1997;278:1759-66.

Cummings KM, Giovino G, Sciandra R, Koenigsberg M, Emont SL. Physician advice to quit smoking: Who gets it and who doesn't. *Am J Prev Med.* 1987;3:69-75.

Cummings KM, Sciandra R, Davis S, Rimer BK. Results of an antismoking media campaign utilizing the Cancer Information Service. *J Natl Cancer Inst Monogr.* 1993:113-8.

Cummings SR, Rubin SM, Oster G. The cost-effectiveness of counseling smokers to quit. *JAMA.* 1989;261:75-9.

Curry S, Wagner EH, Grothaus LC. Intrinsic and extrinsic motivation for smoking cessation. *J Consult Clin Psychol.* 1990;58:310-6.

Curry SJ. Self-help interventions for smoking cessation. *J Consult Clin Psychol.* 1993;61:790-803.

Curry SJ, Grothaus LC, McAfee T, Pabiniak C. Use and cost effectiveness of smoking-cessation services under four insurance plans in a health maintenance organization. *N Engl J Med.* 1998;339:673-9.

Dalack GW, Glassman AH, Rivelli S, Covey L, Stetner F. Mood, major depression, and fluoxetine response in cigarette smokers. *Am J Psychiatry.* 1995;152:398-403.

Danaher BG, Berkanovic E, Gerber B. Mass media based health behavior change: televised smoking cessation program. *Addict Behav.* 1984;9:245-53.

Danielsson T, Rossner S. Smoking cessation rates improved by an intensive weight control program. *Addiction.* 1998;93:913.

Daughton DM, Fortmann SP, Glover ED, et al. The smoking cessation efficacy of varying doses of nicotine patch delivery systems 4 to 5 years post-quit day. *Prev Med.* 1999;28:113-8.

Daughton DM, Heatley SA, Prendergast JJ, et al. [Effects of transdermal nicotine as an adjunct in smoking cessation therapy. A double blind randomized study controlled with placebo]. *Arch Monaldi Mal Torace.* 1992;47:17-29.

Davis DA, Thomson MA, Oxman AD, Haynes RB. Evidence for the effectiveness of CME. A review of 50 randomized controlled trials. *JAMA.* 1992;268:1111-7.

Davison R, Kaplan K, Fintel D, Parker M, Anderson L, Haring O. The effect of clonidine on the cessation of cigarette smoking. *Clin Pharmacol Ther.* 1988;44:265-7.

Decker BD, Evans RG. Efficacy of a minimal contact version of a multimodal smoking cessation program. *Addict Behav.* 1989;14:487-91.

Dey P, Foy R, Woodman M, Fullard B, Gibbs A. Should smoking cessation cost a packet? A pilot randomized controlled trial of the cost-effectiveness of distributing nicotine therapy free of charge. *Br J Gen Pract.* 1999;49:127-8.

Dijkstra A, De Vries H, Roijackers J. Computerized tailored feedback to change cognitive determinants of smoking: a Dutch field experiment. *Health Educ Res.* 1998;13:197-206.

Dijkstra A, De Vries H, Roijackers J, van Breukelen G. Tailoring information to enhance quitting in smokers with low motivation to quit: Three basic efficacy questions. *Health Psychol.* 1998;17:513-9.

Dolan TA, McGorray SP, Grinstead-Skigen CL, Mecklenburg R. Tobacco control activities in U.S. dental practices. *J Am Dent Assoc.* 1997;129:1669-79.

Downey KK, Pomerleau CS, Huth AC, Silk KR. The effect of a restricted smoking policy on motivation to quit smoking in psychiatric patients. *J Addict Dis.* 1998;17:1-7.

Eddy DM. Setting priorities for cancer control programs. *J Natl Cancer Inst.* 1986;76:187-99.

Edwards NB, Murphy JK, Downs AD, Ackerman BJ, Rosenthal TL. Doxepin as an adjunct to smoking cessation: A double blind pilot study. *Am J Psychiatry.* 1989;146:373-6.

Elixhauser A. The costs of smoking and the cost effectiveness of smoking-cessation programs. *J Public Health Policy.* 1990;11:218-37.

Erfurt JC, Foote A, Heirich MA. The cost-effectiveness of work-site wellness programs for hypertension control, weight loss, and smoking cessation. *J Occup Med.* 1991;33:962-70.

Fagerstrom KO, Schneider NG, Lunell E. Effectiveness of nicotine patch and nicotine gum as individual versus combined treatments for tobacco withdrawal symptoms. *Psychopharmacology (Berl).* 1993;111:271-7.

Farebrother MJ, Pearce SJ, Turner P, Appleton DR. Propranolol and giving up smoking. *Br J Dis Chest.* 1980;74:95-6.

Ferry LH, Burchette RJ. Efficacy of bupropion for smoking cessation in non depressed smokers. *J Addict Dis.* 1994;13:249.

Ferry LH, Robbins AS, Scariati PD, et al. Enhancement of smoking cessation using the antidepressant bupropion hydrochloride. *Circulation.* 1992;86:2670.

Fiore MC, Epps RP, Manley MW. A missed opportunity. Teaching medical students to help their patients successfully quit smoking. *JAMA.* 1994;271:624-6.

Fiore MC, Jorenby DE, Schensky AE, Smith SS, Bauer RR, Baker TB. Smoking status as the new vital sign: Effect on assessment and intervention in patients who smoke. *Mayo Clin Proc.* 1995;70:209-13.

Fiore MC, Novotny TE, Pierce JP, et al. Methods used to quit smoking in the United States. Do cessation programs help? *JAMA.* 1990;263:2760-5.

Fiore MC, Smith SS, Jorenby DE, Baker TB. The effectiveness of the nicotine patch for smoking cessation. A meta-analysis. *JAMA.* 1994;271:1940-7.

Fiscella K, Franks P. Cost-effectiveness of the transdermal nicotine patch as an adjunct to physicians' smoking cessation counseling . *JAMA.* 1996;275:1247-51.

Fisher Jr. EB, Lichtenstein E, Haire-Joshu D, Morgan GD, Rehberg HR. Methods, successes, and failures of smoking cessation programs. *Annu Rev Med.* 1993;44:481-513.

Folsom AR, Grimm Jr. RH. Stop smoking advice by physicians: A feasible approach? *Am J Public Health.* 1987;77:849-50.

Fosnocht KM. Cost-effectiveness of the AHCPR guidelines for smoking. *JAMA.* 1998;279:837.

Foulds J, Stapleton J, Hayward M, et al. Transdermal nicotine patches with low-intensity support to aid smoking cessation in outpatients in a general hospital. A placebo-controlled trial. *Arch Fam Med.* 1993;2:417-23.

Frank E, Winkleby MA, Altman DG, Rockhill B, Fortmann SP. Predictors of physician's smoking cessation advice. *JAMA.* 1991;266:3139-44.

Franks P, Harp J, Bell B. Randomized, controlled trial of clonidine for smoking cessation in a primary care setting. *JAMA.* 1989;262:3011-3.

Gauen SE, Lee NL. Pharmacists' role in a smoking-cessation program at a managed health care organization. *Am J Health Syst Pharm.* 1995;52:294-6.

Glasgow RE. Effects of a self-control manual, rapid smoking, and amount of therapist contact on smoking reduction. *J Consult Clin Psychol.* 1978;46:1439-47.

Glassman AH. Psychiatry and cigarettes. *Arch Gen Psychiatry.* 1998;55:692-3.

Glassman AH, Jackson WK, Walsh BT, Roose SP, Rosenfeld B. Cigarette craving, smoking withdrawal, and clonidine. *Science.* 1984;226:864-6.

Glover ED, Glover PN, Franzon M, et al. A nicotine sublingual tablet for smoking cessation: 6-month data. 10th World Conference on Tobacco and Health: Beijing, China.

Goldman LK, Glantz SA. Evaluation of antismoking advertising campaigns. *JAMA.* 1998;278:772-7.

Gould KA, Eickhoff-Shemek JM, Stacy RD, Mecklenburg RE. The impact of National Cancer Institute training on clinical tobacco use cessation services by oral health teams. *J Am Dent Assoc.* 1998;129:1442-9.

Gourlay S. The pros and cons of transdermal nicotine therapy. *Med J Aust.* 1994;160:152-9.

Gourlay S, Forbes A, Marriner T, Kutin J, McNeil J. A placebo-controlled study of three clonidine doses for smoking cessation. *Clin Pharmacol Ther.* 1994;55:64-9.

Gourlay SG, Benowitz NL. Is clonidine an effective smoking cessation therapy? *Drugs.* 1995;50:197-207.

Grimaldi B, Demaria C, Loufrani E, Bang F, Geslin P, Lagrue G. Results from a controlled study of clonidine vs. placebo for cessation of smoking. *Sem Hop.* 1987;63:3369-70.

Hajek P. Current issues in behavioral and pharmacological approaches to smoking cessation. *Addict Behav.* 1996;21:699-707.

Hajek P. Withdrawal-oriented therapy for smokers. *Br J Addict.* 1989;84:591-8.

Hajek P, West R. Treating nicotine dependence: The case for specialist smokers' clinics. *Addiction.* 1998;93:637-40.

Hajek P, West R, Foulds J, Nilsson F, Burrows S, Meadow A. Randomized comparative trial of nicotine polacrilex, a transdermal patch, nasal spray, and an inhaler. *Arch Intern Med.* 1999;159:2033-9.

Hall SM, Tunstall CD, Rugg D, Jones RT, Benowitz N. Nicotine gum and behavioral treatment in smoking cessation. *J Consult Clin Psychol.* 1985;53:256-8.

Harris JE, Chan SW. The continuum-of-addiction: Cigarette smoking in relation to price among Americans aged 15-29. *Health Econ.* 1999;8:81-6.

Hartman N, Jarvik ME, Wilkins JN. Reduction of cigarette smoking by use of a nicotine patch. *Arch Gen Psychiatry.* 1989;46:289.

Hastreiter RJ, Bakdash B, Roesch MH, Walseth J. Use of tobacco prevention and cessation strategies and techniques in the dental office. *J Am Dent Assoc.* 1994;125:1475-84.

Helton DR, Rasmussen K, Kallman MJ. Clonidine attenuates increases in sensorimotor reactivity resulting form withdrawal of chronic nicotine. *Addiction.* 1997;9:626.

Henningfield JE. Nicotine medications for smoking cessation. *N Engl J Med.* 1995;333:1196-203.

Hermanson B, Omenn GS, Kronmal RA, Gersh BJ. Beneficial six-year outcome of smoking cessation in older men and women with coronary artery disease. Results from the CASS registry. *N Engl J Med.* 1988;319:1365-9.

Higashi A, Ozasa K, Watanabe Y, et al. [Efficacy of smoking cessation instruction for general smokers at an annual physical examination]. *Nippon Koshu Eisei Zasshi.* 1995;42:313-21.

Hilleman DE, Mohiuddin SM, Del Core MG, Sketch Sr. MH. Effect of buspirone on withdrawal symptoms associated with smoking cessation. *Arch Intern Med.* 1992;152:350-2.

Hilleman DE, Mohiuddin SM, Malesker MA, Delcore MG, Sketch MH. Double blind, placebo-controlled evaluation of transdermal clonidine in smoking cessation. *Chest.* 1989;96 (Suppl):208S.

Hollis JF, Lichtenstein E, Mount K, Vogt TM, Stevens VJ. Nurse-assisted smoking counseling in medical settings: Minimizing demands on physicians. *Prev Med.* 1991;20:497-507.

Hudmon KS, Gritz ER, Clayton S, Nisenbaum R. Eating orientation, postcessation weight gain, and continued abstinence among female smokers receiving an unsolicited smoking cessation intervention. *Health Psychol.* 1999;18:29-36.

Hughes JR. Non-nicotine pharmacotherapies for smoking cessation. *J Drug Development.* 1994;6:197-203.

Hughes JR, Gulliver SB, Amori G, Mireault GC, Fenwick JF. Effect of instructions and nicotine on smoking cessation, withdrawal symptoms and self-administration of nicotine gum. *Psychopharmacology (Berl).* 1989;99:486-91.

Humair JP, Ward J. Smoking-cessation strategies observed in videotaped general practice consultations. *Am J Prev Med.* 1998;14:1-8.

Hurt RD, Dale LC, Offord KP, Bruce BK, McClain FL, Eberman KM. Inpatient treatment of severe nicotine dependence. *Mayo Clin Proc.* 1992;67:823-8.

Hurt RD, Eberman KM, Croghan IT, et al. Nicotine dependence treatment during inpatient treatment for other addictions: A prospective intervention trial. *Alcohol Clin Exp Res.* 1994;18:867-72.

Hurt RD, Lauger GG, Offord KP, Bruce BK, Dale LC. An integrated approach to the treatment of nicotine dependence in a medical setting. *Clin Res.* 1991;39:636A.

Hurt RD, Lauger GG, Offord KP, Kottke TE, Dale LC. Nicotine-replacement therapy with use of a transdermal nicotine patch--a randomized double-blind placebo-controlled trial. *Mayo Clin Proc.* 1990;65:1529-37.

Jason LA, Gruder CL, Martino S, Flay BR, Warnecke R, Thomas N. Work site group meetings and the effectiveness of a televised smoking cessation intervention. *Am J Community Psychol.* 1987;15:57-72.

Jason LA, Liotta RF. Reduction of cigarette smoking in a university cafeteria. *J Appl Behav Anal.* 1982;15:573-7.

Jeffery RW, Danaher BG, Killen J, Farquhar JW, Kinnier R. Self-administered programs for health behavior change: Smoking cessation and weight reduction by mail. *Addict Behav.* 1982;7:57-63.

Johnston JA. Glaxo Wellcome, Presentation for FDA approval of Buproprion sustained release for smoking cessation.

Katz RC, Heiman M, Gordon S. Effects of two self-management approaches on cigarette smoking. *Addict Behav.* 1977;2:113-9.

Kawane H. Smoking cessation in comprehensive pulmonary rehabilitation. *Lancet.* 1997;349:285.

Kelder Jr. GE, Daynard RA. Judicial approaches to tobacco control: The third wave of tobacco litigation as a tobacco control mechanism. *The Journal of Social Issues.* 1997;53:169-86.

Killen JD, Fortmann SP, Newman B, Varady A. Evaluation of a treatment approach combining nicotine gum with self-guided behavioral treatments for smoking relapse prevention. *J Consult Clin Psychol.* 1990;58:85-92.

Knapp JM, Kottke TE, Heitzig C. A controlled trial to implement smoke-free hospitals. *Minn Med.* 1989;72:713-6.

Kottke TE, Battista RN, DeFriese GH, Brekke ML. Attributes of successful smoking cessation interventions in medical practice. A meta-analysis of 39 controlled trials. *JAMA.* 1988;259:2883-9.

Kottke TE, Solberg LI, Brekke ML, Conn SA, Maxwell P, Brekke MJ. A controlled trial to integrate smoking cessation advice into primary care practice: Doctors Helping Smokers, Round III. *J Fam Pract.* 1992;34:701-8.

Kozlowski LT, Page A. A second look at the effects of supportive follow-up on smoking cessation. *CMAJ.* 1987;137:605-7.

Krumholz HM, Cohen BJ, Tsevat J, Pasternak RC, Weinstein MC. Cost-effectiveness of a smoking cessation program after myocardial infarction. *J Am Coll Cardiol.* 1993;22:1697-1702.

Krumpe P, Malani N, Adler J. Efficacy of transdermal nicotine administration as an adjunct for smoking cessation in heavily nicotine addicted smokers. *Ann Rev Resp Dis.* 1989;139:A337.

Lam W, Sze PC, Sacks HS, Chalmers TC. Meta-analysis of randomised controlled trials of nicotine chewing gum. *Lancet.* 1987;2:27-30.

Law M, Tang JL. An analysis of the effectiveness of interventions intended to help people stop smoking. *Arch Intern Med.* 1995;155:1933-41.

Ledwith F. Immediate and delayed effects of postal advice on stopping smoking. 5th World Conference on Smoking and Health: Winnipeg, Canada. Canadian Council on Smoking and Health; 383-7.

Li VC, Coates TJ, Spielberg LA, Ewart CK, Dorfman S, Huster WJ. Smoking cessation with young women in public family planning clinics: The impact of physician messages and waiting room media. *Prev Med.* 1984;13:477-89.

Li Wan Po A. Transdermal nicotine in smoking cessation. A meta-analysis. *Eur J Clin Pharmacol.* 1993;45:519-28.

Lichtenstein E, Glasgow RE, Lando HA, Ossip-Klein DJ, Boles SM. Telephone counseling for smoking cessation: Rationales and meta-analytic review of evidence. Health Education Research. 1996;11:243-257.

Lichtenstein E, Hollis J. Patient referral to a smoking cessation program: Who follows through? *J Fam Pract.* 1992;34:739-44.

Lichtenstein E, Hollis JF, Severson HH, et al. Tobacco cessation interventions in health care settings: Rationale, model, outcomes. *Addict Behav.* 1996;21:709-20.

Lilley J, Forster DP. A randomised controlled trial of individual counseling of smokers in pregnancy. *Public Health.* 1986;100:309-15.

MacKenzie TD, Bartecchi CE, Schrier RW. The human costs of tobacco use (2). *N Engl J Med.* 1994;330:975-80.

Madison JS, Schlede CM, Forte JL, Covey DG, Shaw RF. Evaluating the length of transdermal nicotine replacement therapy in relation to the effectiveness of a smoking cessation clinic. *J Addict Dis.* 1998;17:PA18-A18.

McClure JB, Skaar K, Tsoh J, Wetter DW, Cinciripini PM, Gritz ER. Smoking cessation. 3: Needed healthcare policy changes. *Behav Med.* 1997;23:29-34.

McGhan WF, Smith MD. Pharmacoeconomic analysis of smoking-cessation interventions . *Am J Health Syst Pharm.* 1996;53:45-52.

McIntyre KO, Lichtenstein E, Mermelstein RJ. Self-efficacy and relapse in smoking cessation: A replication and extension. *J Consult Clin Psychol.* 1983;51:632-3.

McMahon SD, Jason LA, Salina D. Stress, coping, and appraisal in a smoking cessation intervention. *Anxiety, Stress, and Coping.* 1994;7:161-71.

Mizes JS, Sloan DM, Segraves K, Spring B, Pingatore R, Kristeller J. Fluoxetine and weight-gain in smoking cessation - Examination of actual weight-gain and fear of weight-gain. *Psychopharmacol Bull.* 1996;32:491.

Moore BL. An investigation of nicotine gum in a smoking cessation program for a respiratory care center population. *Dissertation Abstracts International.* 1986;47:SECB-PP2626.

Mori T, Shimao T, Yulchiro G, Namiki M, Hyachi T. A clinical trial of nicotine chewing gum for smoking cessation. 8th World Conference on Tobacco and Health: Buenos Aires, Argentina.

Mudde AN, De Vries H. The reach and effectiveness of a national mass media-led smoking cessation campaign in The Netherlands. *Am J Public Health.* 1999;89:346-50.

Mulligan SC, Masterson JG, Devane JG, Kelly JG. Clinical and pharmacokinetic properties of a transdermal nicotine patch. *Clin Pharmacol Ther.* 1990;47:331-7.

Murphy JK, Edwards NB, Downs AD, Ackerman BJ, Rosenthal TL. Effects of doxepin on withdrawal symptoms in smoking cessation. *Am J Psychiatry.* 1990;147:1353-7.

Murray KM, Cappello C, Baez SA. Lack of efficacy of transdermal clonidine in a smoking cessation class. *Am Rev Respir Dis.* 1989;138 (Suppl):A338.

Nana A, Praditsuwan R. Clonidine for smoking cessation. *J Med Assoc Thai.* 1998;81:87-93.

National Cancer Institute. Tobacco and the clinician: Interventions for medical and dental practice. NIH Publication No. 94-3693. *Monogr Natl Cancer Inst.* 1994;5:1-22.

Niaura R, Abrams D, Shade WG, Monti P, Rohsenow D, Sirota A. Cue exposure treatment for smoking cessation: A controlled clinical trial. *Addiction.* 1997;9:627.

Niaura R, Goldstein M, Spring B, et al. Fluoxetine for smoking cessation: A multicenter randomized double blind dose response study. Society for Behavioral Medicine Annual Meeting: San Francisco.

O'Hara P, Gerace TA, Elliott LL. Effectiveness of self-help smoking cessation guides for firefighters. *J Occup Med.* 1993;35:795-9.

O'Keefe J, Lessio A, Kassirer B. A pilot smoking cessation program involving dental offices in the borough of East York, Ontario: An initial evaluation. *J Can Dent Assoc.* 1995;61:65-7.

O'Loughlin J, Paradis G, Renaud L, Meshefedjian G, Barnett T. The ”Yes, I Quit“ smoking cessation course: Does it help women in a low-income community quit? *J Community Health.* 1997;22:451-68.

Ockene JK. Smoking intervention: The expanding role of the physician. *Am J Public Health.* 1987;77:782-3.

Ockene JK, Adams A, Pbert L, et al. The Physician-Delivered Smoking Intervention Project: Factors that determine how much the physician intervenes with smokers. *J Gen Intern Med.* 1994;9:379-84.

Ockene JK, Zapka JG. Physician-based smoking intervention: A rededication to a five-step strategy to smoking research. *Addict Behav.* 1997;22:835-48.

Orleans CT. Reducing tobacco harms among older adults: A critical agenda for tobacco control. *Tob Control.* 1997;6:161-3.

Orleans CT, Jepson C, Resch N, Rimer BK. Quitting motives and barriers among older smokers. The 1986 Adult Use of Tobacco Survey revisited. *Cancer.* 1994;74:2055-61.

Orleans CT, Resch N, Noll E, et al. Use of transdermal nicotine in a state-level prescription plan for the elderly. A first look at ”real-world” patch users. *JAMA.* 1994;271:601-7.

Orleans CT, Rimer BK, Cristinzio S, Keintz MK, Fleisher L. A national survey of older smokers: Treatment needs of a growing population. *Health Psychol.* 1991;10:343-51.

Orleans CT, Schoenbach VJ, Salmon MA, et al. A survey of smoking and quitting patterns among black Americans. *Am J Public Health.* 1989;79:176-81.

Ornish SA, Zisook S, McAdams LA. Effects of transdermal clonidine treatment on withdrawal symptoms associated with smoking cessation. A randomized, controlled trial. *Arch Intern Med.* 1988;148:2027-31.

Oster G, Huse DM, Delea TE, Colditz GA. Cost-effectiveness of nicotine gum as an adjunct to physician's advice against cigarette smoking. *JAMA.* 1986;256:1315-8.

Owen N, Wakefield M, Roberts L, Esterman A. Stages of readiness to quit smoking: Population prevalence and correlates. *Health Psychol.* 1992;11:413-7.

Owen P, Duncan L. One-year outcomes of a residential smoking cessation program. *Journal of Addictive Diseases.* 1997;16:135.

Parker M, Newman J, Leyden W. Aspirin and smoking cessation for peripheral arterial disease. In: Narrative Project Document #C95BI. California Medical Review, Inc. 1998.

Parrott S, et al. Guidance for commissioners on the cost-effectiveness of smoking cessation interventions. *Thorax.* 1998;53 Suppl 5:s1-38.

Patten CA, Croghan GA, Hurt RD, et al. Relationship of alcoholism and depression to smoking abstinence rates with transdermal nicotine patch versus nicotine nasal spray versus both for smoking cessation. *J Addict Dis.* 1998;17:PA10-A10.

Patten CA, Hayford KE, Schroeder DR, et al. Efficacy of bupropion for smokers with a history of alcoholism. *Journal of Addictive Diseases.* 1997;16:125.

Paul CL, Sanson-Fisher RW. Experts' agreement on the relative effectiveness of 29 smoking reduction strategies. *Prev Med.* 1996;25:517-26.

Pederson LL. Compliance with physician advice to quit smoking: A review of the literature. *Prev Med.* 1982;11:71-84.

Pederson LL, Scrimgeour WG, Lefcoe NM. Comparison of hypnosis plus counseling, counseling alone, and hypnosis alone in a community service smoking withdrawal program. *J Consult Clin Psychol.* 1975;43:920.

Pinto BM, Borrelli B, King TK, et al. Weight control smoking among sedentary women. *Addict Behav.* 1999;24:75-86.

Pomerleau OF, Pomerleau CS, Morrell EM, Lowenbergh JM. Effects of fluoxetine on weight gain and food intake in smokers who reduce nicotine intake. *Psychoneuroendocrinology.* 1991;16:433-40.

Prochaska JO, DiClemente CC. Stages and processes of self-change of smoking: Toward an integrative model of change. *J Consult Clin Psychol.* 1983;51:390-5.

Prochaska JO, Goldstein MG. Process of smoking cessation: Implications for clinicians. *Clin Chest Med.* 1991;42:727-75.

Prochazka AV, Petty TL, Nett L, et al. Transdermal clonidine reduced some withdrawal symptoms but did not increase smoking cessation. *Arch Intern Med.* 1992;152:2065-9.

Quilez Garcia C, Hernando Arizaleta L, Rubio Diaz A, Estruch Riba J, Fornes Ramis MV. [Smoking addiction treatment, with nicotine chewing gum, in primary care. Double-blind study]. *Rev Clin Esp.* 1993;192:157-61.

Quilez Garcia C, Hernando Arizaleta L, Rubio Diaz A, Granero Fernandez EJ, Vila Coll MA, Estruch Riba J. [Double-blind study of the efficacy of nicotine chewing gum for smoking cessation in the primary care setting]. *Aten Primaria.* 1989;6:719-26.

Ratcliffe J, Cairns J, Platt S. Cost effectiveness of a mass media-led anti-smoking campaign in Scotland. *Tob Control.* 1997;6:104-10.

Raw M, et al. Smoking cessation guidelines for health professionals. *Thorax.* 1998;53 Suppl 5:s1-19.

Richmond R, Mendelsohn C, Kehoe L. Family physicians' utilization of a brief smoking cessation program following reinforcement contact after training: A randomized trial. *Prev Med.* 1998;27:77-83.

Richomond R, Heather N. General practitioner interventions for smoking cessation: Past results and future prospects. *Behav Change.* 1990;7:110-9.

Rigotti NA, Bourne D, Rosen A, Locke JA, Schelling TC. Workplace compliance with a no-smoking law: A randomized community intervention trial. *Am J Public Health.* 1992;82:229-35.

Rimer BK, Orleans CT. The family physician's role in helping older smokers quit. *Am Fam Physician.* 1990;42:959-60, 962, 965.

Rimer BK, Orleans CT, Keintz MK, Cristinzio S, Fleisher L. The older smoker. Status, challenges and opportunities for intervention. *Chest.* 1990;97:547-53.

Robinson MD, Laurent SL, Little Jr. JM. Including smoking status as a new vital sign: It works! *J Fam Pract.* 1995;40:556-61.

Robinson MD, Pettice YL, Smith WA, Cederstrom EA, Sutherland DE, Davis H. Buspirone effect on tobacco withdrawal symptoms: A randomized placebo-controlled trial. *J Am Board Fam Pract.* 1992;5:1-9.

Robinson MD, Smith WA, Cederstrom EA, Sutherland DE. Buspirone effect on tobacco withdrawal symptoms: A pilot study. *J Am Board Fam Pract.* 1991;4:89-94.

Roche AM, Eccleston P, Sanson-Fisher R. Teaching smoking cessation skills to senior medical students: A block-randomized controlled trial of four different approaches. *Prev Med.* 1996;25:251-8.

Rolnick SJ, Klevan D, Cherney L, Lando HA. Nicotine replacement therapy in a group model HMO. *HMO Pract.* 1997;11:34-7.

Rosal MC, Ockene JK, Hurley TG, Kalan K, Hebert JR. Effectiveness of nicotine-containing gum in the Physician-Delivered Smoking Intervention Study. *Prev Med.* 1998;27:262-7.

Rose G, Colwell L. Randomised controlled trial of anti-smoking advice: Final (20 year) results. *J Epidemiol Community Health.* 1992;46:75-7.

Rose G, Hamilton PJ, Colwell L, Shipley MJ. A randomised controlled trial of anti-smoking advice: 10-year results. *J Epidemiol Community Health.* 1982;36:102-8.

Rose JE, Levin ED, Behm FM, Adivi C, Schur C. Transdermal nicotine facilitates smoking cessation. *Clin Pharmacol Ther.* 1990;47:323-30.

Royce JM, Ashford A, Resnicow K, Freeman HP, Caesar AA, Orlandi MA. Physician- and nurse-assisted smoking cessation in Harlem. *J Natl Med Assoc.* 1995;87:291-300.

Royce JM, Hymowitz N, Corbett K, Hartwell TD, Orlandi MA. Smoking cessation factors among African Americans and whites. COMMIT Research Group. *Am J Public Health.* 1993;83:220-6.

Russell MA, Stapleton JA, Feyerabend C, et al. Targeting heavy smokers in general practice: Randomised controlled trial of transdermal nicotine patches. *BMJ.* 1993;306:1308-12.

Sallis JF, Hill RD, Killen JD, et al. Efficacy of self-help behavior modification materials in smoking cessation. *Am J Prev Med.* 1986;2:342-4.

Salvador Llivina T, Marin Tuya D, Gonzalez Quintana J, et al. [Treatment of smoking: Efficacy of the use of nicotine chewing gum. Double-blind study]. *Med Clin (Barc).* 1988;90:646-50.

Sanders D. London: Department of Public Health and Policy; 1992.

Satcher D, Eriksen M. The paradox of tobacco control. *JAMA.* 1994;271:627-8.

Schmitz J, Bordnick PS, Spigai R. The relationship of cigarette smoking to cocaine and alcohol outcome following inpatient/outpatient treatment. *Addiction.* 1997;9:630.

Schmitz JM, Bordnick PS, Le T. Quitting smoking with or without treatment: Preliminary findings. *Addiction.* 1997;9:630.

Schmitz JM, Bordnick PS, Le T. Smoking cessation in women with heart disease risk: A preliminary comparison of two treatment models. *Addiction.* 1997;9:629-30.

Schwartz JL, Dubitzky M. The smoking control research project: Purpose, design, and initial results. *Psychol Rep.* 1967;20:367-76.

Serra C, Bonfill X, Lopez V. Consumo y venta de tabaco en lugares públicos: Evaluación del cumplimiento de la normativa vigente. *Gac Sanit.* 1997;11:55-65.

Severson H, Andrews J, Lichtenstein E, Gordon J, Unfried P, Over B. Interventions for smoking tobacco and smoking in dental practices. *Manuscript in Preparation.* 1996.

Severson HH, Eakin EG, Stevens VJ, Lichtenstein E. Dental office practices for tobacco users: Independent practice and HMO clinics. *Am J Public Health.* 1990;80:1503-5.

Shiffman S, Gitchell J, Stecher V, et al. Real-world efficacy of computer-tailored smoking cessation material as a supplement to nicotine replacement. 10th World Congress on Smoking and Health: Beijing, China.

Shiffman S, Paty J, Rohay J, di Marino M, Strecher V. Copenhagen, Denmark: Society for Research on Nicotine and Tobacco; 1998.

Sidorov J, Christianson M, Girolami S, Wydra C. A successful tobacco cessation program led by primary care nurses in a managed care setting. *Am J Manag Care.* 1997;3:207-14.

Siegel M. Mass media antismoking campaigns: a powerful tool for health promotion. *Ann Intern Med.* 1998;129:128-32.

Siegel M, Biener L. Evaluating the impact of statewide anti-tobacco campaigns: The Massachusetts and California tobacco control programs. *The Journal of Social Issues.* 1997;53:147-68.

Silagy C, Mant D, Fowler G, Lodge M. Meta-analysis on efficacy of nicotine replacement therapies in smoking cessation. *Lancet.* 1994;343:139-42.

Simons-Morton DG, Mullen PD, Mains DA, Tabak ER, Green LW. Characteristics of controlled studies of patient education and counseling for preventive health behaviors. *Patient Educ Couns.* 1992;19:175-204.

Skaar KL, Tsoh JY, McClure JB, et al. Smoking cessation. 1: An overview of research. *Behav Med.* 1997;23:5-13.

Smeeth L, Fowler G. Nicotine replacement therapy for a healthier nation. Nicotine replacement is cost effective and should be prescribable on the NHS. *BMJ.* 1998;317:1266-7.

Smith MD, McGhan WF, Lauger G. Pharmacist counseling and outcomes of smoking cessation. *Am Pharm.* 1995;NS35:20-9; 32.

Smith SE, Warnakulasuriya KA, Feyerabend C, Belcher M, Cooper DJ, Johnson NW. A smoking cessation programme conducted through dental practices in the UK. *Br Dent J.* 1998;185:299-303.

Sofian NS, McAfee T, Wilson J, Levan S. Telephone smoking cessation intervention: The free and clear program. *HMO Pract.* 1995;9:144-6.

Spring B, Wurtman J, Wurtman R, et al. Efficacies of dexfenfluramine and fluoxetine in preventing weight gain after smoking cessation. *Am J Clin Nutr.* 1995;62:1181-7.

Stapleton JA, Lowin A, Russell MA. Prescription of transdermal nicotine patches for smoking cessation in general practice: Evaluation of cost-effectiveness. *Lancet.* 1999;354:210-5.

Stein RA, Jarvik ME, Gorelick DA. Impairment of memory by fluoxetine in smokers. *Exp Clin Psychopharmacol.* 1993;1:188-93.

Stevens VJ, Severson H, Lichtenstein E, Little SJ, Leben J. Making the most of a teachable moment: A smokeless-tobacco cessation intervention in the dental office. *Am J Public Health.* 1995;85:231-5.

Stewart C. Investigation of cigarette smokers who quit without treatment. *Journal of Drug Issues.* 1999;29:167-85.

Stitzer ML, Bigelow GE. Contingent reinforcement for reduced breath carbon monoxide levels: Target-specific effects on cigarette smoking. *Addict Behav.* 1985;10:345-9.

Stotts RC, Glynn TJ, Baquet CR. Smoking cessation among blacks. *J Health Care Poor Underserved.* 1991;2:307-19.

Suedfeld P, Ikard FF. Use of sensory deprivation in facilitating the reduction of cigarette smoking. *J Consult Clin Psychol.* 1974;42:888-95.

Supnick JA, Colletti G. Relapse coping and problem solving training following treatment for smoking. *Addict Behav.* 1984;9:401-4.

Tang JL, Law M, Wald N. How effective is nicotine replacement therapy in helping people to stop smoking? *BMJ.* 1994;308:21-6.

Tengs TO, Adams ME, Pliskin JS, et al. Five hundred life-saving interventions and their cost-effectiveness. *Risk Anal.* 1995;15:369-90.

Tennant Jr. FS, Tarver AL. Withdrawal from nicotine dependence using mecamylamine: Comparison of three-week and six-week dosage schedules. *NIDA Res Monogr.* 1984;55:291-7.

Tennant Jr. FS, Tarver AL, Rawson RA. Clinical evaluation of mecamylamine for withdrawal from nicotine dependence. *NIDA Res Monogr.* 1984;49:239-46.

Thompson B, Rich LE, Lynn WR, Shields R, Corle DK. A Voluntary Smokers' Registry: Characteristics of joiners and non-joiners in the Community Intervention Trial for Smoking Cessation (COMMIT). *Am J Public Health.* 1998;88:100-3.

Thorndike AN, Rigotti NA, Stafford RS, Singer DE. National patterns in the treatment of smokers by physicians. *JAMA.* 1998;279:605-8.

Tomar SL, Husten CG, Manley MW. Do dentists and physicians advise tobacco users to quit? *J Am Dent Assoc.* 1996;127:259-65.

Tonnesen P, Norregaard J, Simonsen K, Sawe U. [A double-blind trial of nicotine patches in smoking cessation]. *Ugeskr Laeger.* 1992;154:251-4.

Tsevat J. Impact and cost-effectiveness of smoking interventions. *Am J Med.* 1992;93:43S-47S.

Tsoh JY, McClure JB, Skaar KL, et al. Smoking cessation. 2: Components of effective intervention. *Behav Med.* 1997;23:15-27.

Ward J, Sanson-Fisher R. Does a 3-day workshop for family medicine trainees improve preventive care? A randomized control trial. *Prev Med.* 1996;25:741-7.

Ward KD, Klesges RC, Halpern MT. Predictors of smoking cessation and state of the art smoking interventions. *The Journal of Social Issues.* 1997;53:129-45.

Warnecke RB, Flay BR, Kviz FJ, et al. Characteristics of participants in a televised smoking cessation intervention. *Prev Med.* 1991;20:389-403.

Warner KE. Cost effectiveness of smoking-cessation therapies. Interpretation of the evidence and implications for coverage. *Pharmacoeconomics.* 1997;11:538-49.

Wasley MA, McNagny SE, Phillips VL, Ahluwalia JS. The cost-effectiveness of the nicotine transdermal patch for smoking cessation . *Prev Med.* 1997;26:264-70.

Wechsler H, Levine S, Idelson RK, Rohman M, Taylor JO. The physician's role in health promotion--a survey of primary-care practitioners. *N Engl J Med.* 1983;308:97-100.

West R, Hajek P, McNeill A. Effect of buspirone on cigarette withdrawal symptoms and short-term abstinence rates in a smokers clinic. *Psychopharmacology (Berl).* 1991;104:91-6.

Wewers ME, Bowen JM, Stanislaw AE, Desimone VB. A nurse-delivered smoking cessation intervention among hospitalized postoperative patients--influence of a smoking-related diagnosis: A pilot study. *Heart Lung.* 1994;23:151-6.

Wewers ME, Jenkins L, Mignery T. A nurse-managed smoking cessation intervention during diagnostic testing for lung cancer. *Oncol Nurs Forum.* 1997;24:1419-22.

Windsor RA, Cutter G, Morris J, et al. The effectiveness of smoking cessation methods for smokers in public health maternity clinics: A randomized trial. *Am J Public Health.* 1985;75:1389-92.

Wiseman EJ. Nicotine replacement therapy and smoking reduction as an interim goal. *JAMA.* 1998;279:194-5.

Ziedonis D, Harris P, Brandt P, et al. Motivational enhancement therapy and nicotine replacement improve smoking cessation outcomes for smokers with schizophrenia or depression. *Addiction.* 1997;9:633.

Zinser M, Murphy L, Miller L, Prochazka A. Personalizing the health risk message: Effects on smoking cessation. *Addiction.* 1997;9:633